

A satellite view of Europe at night, showing the continent illuminated by city lights against the dark background of the Earth and space. The horizon of the Earth is visible, with a thin blue line of the atmosphere separating the dark land from the starry space above.

Yearly Activity Report 2020

coreso

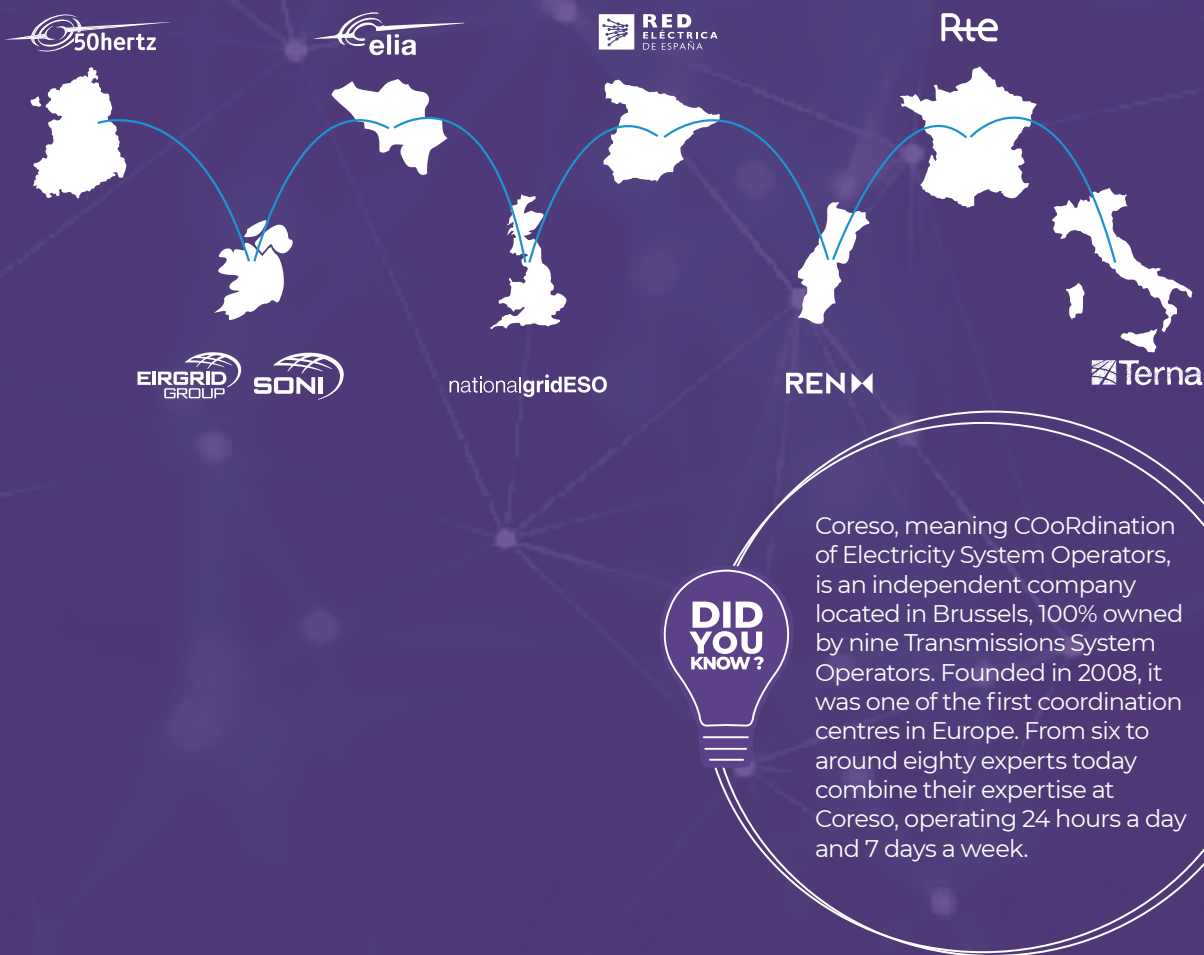
One of the six RSCs coordinating electricity flows for all European Transmission Systems Operators

HEADING TOWARDS A GREEN TRANSITION AND A FURTHER OPTIMISED EUROPEAN TRANSMISSION GRID.

Collaborating together, six Regional Security Coordinators proactively support Transmission System Operators to ensure the security of electricity supply on a European regional level. This support is conducted from one year ahead until intraday (a few hours before real time), by constituting common grid models, providing national control centres with forecasts about security of systems, performing operational planning activities and conducting security analyses which simulate numerous scenarios. Suggesting remedial actions and coordinating exchanges between national control centres are also part of Regional Security Coordinators' main activities.

While the electricity sector regulatory framework is further being implemented, Regional Security Coordinators (RSCs) also play a key coordination role. As service providers to Transmission System Operators (TSOs), RSCs assist them in their objective to optimise European grid operational activities and efficiently pursue the Green Deal implementation.

Preparing their evolution to Regional Coordination Centres (RCC) by 2022, RSCs continuously cooperate to meet stakeholders' expectations and regulatory requirements aiming to ensure an operational secured transmission system towards all European electricity consumers.



Abbreviations are commonly used in the electricity sector: as we understand they may be unfamiliar, please go to the glossary at the end of this document for a complete description of the main acronyms used in this report.

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Disclaimer: most of the pictures of this report were taken before the COVID-19 sanitary situation, when wearing a mask at the office was not mandatory.



MANAGEMENT GREETINGS

Dear reader,

Over the past few months, in the context of the COVID-19 crisis, like everyone else, we have had to adapt ourselves to unforeseeable circumstances and sometimes find new solutions to ensure Coreso activities and deliver our services.

For a small company the size of Coreso with many expatriate employees, whose activity required many business trips across Europe, the circumstances surrounding the pandemic required numerous adaptations as well as a strong anticipation. This is how a purely internal task force began, in February 2020, to define the first work and health arrangements to be implemented at Coreso. Subsequently, this task force continued to meet at very regular intervals in order to update internal rules while keeping employees continuously informed. From a team spirit point of view, we did what was necessary to move forward together by using and developing digital communication channels.

We can rejoice in what we have been able to accomplish in this difficult period still ongoing today. In these completely unprecedented circumstances, Coreso's staff have been resilient, showing more commitment and dedication than ever before.

At Coreso's level, 2020 was therefore also marked by progress and success:

- Our goal is to successfully implement the European regulations. However, as the complexity increases, we have to structure our approach. This is why, through the implementation of our Project Management Office, we have continued our work to improve internal processes, towards greater efficiency and greater transparency. The work is far from over, but the first progress is already visible.
- Projects relating to the implementation of the regulated services continued to be delivered despite some uncertainties. Coreso and the other Regional Security Coordinators have thus succeeded in maintaining their contributions to existing working groups, task forces and projects within the framework of ENTSO-E and the capacity calculation regions.
- After 10 years of good and loyal service, taking into account both technical and operational needs, we have completely redesigned our coordination room while bearing in mind the new distancing constraints linked to the health crisis.
- Cooperation with TSCNET has grown even further and reached a new stage of maturity with the start of the cooperation program called CorNet.

2020 has thus been a very rich and challenging year. Looking back on the past year shows that our evolution puts us on the right track, but we are not finished yet. 2021 promises to be a year full of promise in which Coreso and its teams will continue their work with professionalism.

This annual report presents our main achievements in 2020. We hope you will find the information useful and enjoy reading it!

Jean-François Gahungu
Chief Executive Officer (CEO)



CORESO HIGHLIGHTS IN 2020

CGM Service

The **Operational Planning Data Environment** (OPDE) is an IT data exchange platform used by the Common Grid Model (CGM) building process: each TSO and RSC is connected to it to upload and download data. This platform embeds multiple applications used to run the CGM service. This service allows merely to merge the Individual Grid Models (IGM) provided by the TSOs into Common Grid Models (CGM) moving from a 'country' view to a Pan-European view. The CGM building process is like a puzzle: each TSO provides a piece; RSCs assemble them allowing to get an understandable picture.

The working groups under the guidance of the Business Lead Manager drafted:

The **Business Requirements Specifications for the 5 business applications** of the Operational Planning Data Environment (OPDE) as well as an 'End-to-End CGM Building Process' document capturing the steps/timings/ input/outputs of the CGM building process and the application the process relies on. Behind each business application, there is a dedicated process (of TSOs delivering specific input) with its own timing. In a nutshell, the five OPDE business applications are:

- The Common Grid Model Alignment (CGMA) that provides the Alternating Current (AC) net position and Direct Current (DC) schedules for the two-days-ahead timeframe, based on TSOs best forecast;
- The Pan-European Verification Platform (PEVF) that gives the AC net position and DC schedules for the day-ahead and intraday time horizon (market output);
- The Quality Assessment Service application (QAS) that checks the quality of the submitted IGM/CGM;
- The Operational Planning Data Management application (OPDM) that manages the OPDE data flow;
- The Boundary Management Application (BMA) that provides an exhaustive list of the interconnectors.

The **Data quality documentation** and, more specifically, a set of requirements specifying the quality rules the IGM/CGM must be compliant with.

In 2020, Coreso continued to support the **CGM programme delivery**. Our project engineers were involved in the working groups focused on OPDE application and data quality. Coreso filled in the Business Lead Manager role of the programme, being responsible for the delivery and approval by ENTSO-E System Operation Committee (SOC) of key documents.

Each of these documents were subject to a strict commenting and review process with all TSOs, before being submitted to ENTSO-E SOC for approval. From a business standpoint, as a clear set of documentation is available and has been approved, 2021 should be focused on the implementation and testing with a go live of the CGM service in CGMES format by the end of 2021.



ENTSO-E CGM Programme Support

NGSA

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CSA Service

As from September 2020, Coreso is officially providing a Security Analysis Day-Ahead (SA DA) service to National Grid ESO (NGESO - UK TSO).

NGSA is the first SA process in Coreso which uses Individual Grid Models (IGMs) of Transmission System Operators (TSOs) under the Common Grid Model Exchange Standard (CGMES) format, and the first SA process for the Great Britain synchronous area.

SA Reporting tool

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The Security Analysis (SA) reporting tool went operational **on 24 September 2020** for day-ahead activities, and **on 7 and 8 October 2020** for intraday activities.

This SA harmonisation tool aims to provide an answer to the increasing need for structuring data, for being able to retrieve statistics, and to improve our operational efficiency during the SA processes.

As a result, this system provides the four following benefits to Coreso:

1

Saves time for operators and reduces the risk of errors:

- A centralised interface for SA Reporting on different processes and regions;
- Automatic mapping of SA results to readable names, regions and in/out scope;
- Automatic filtering according to operational rules and thresholds;
- Quick selection from the database which contains all possible Remedial Actions (RAs);
- Suggestion to the operator of previously reported RA for a given constraint.

2

Enhances SA service provision for our shareholders:

- Results for full remaining day in security analysis table of all processes;
- Shows evolution of intraday results compared to day-ahead results.

3

Allows us to make KPI of SA process.

4

Helps us draft and design future solutions such as intermediate Coordinated Security Analysis (CSA).



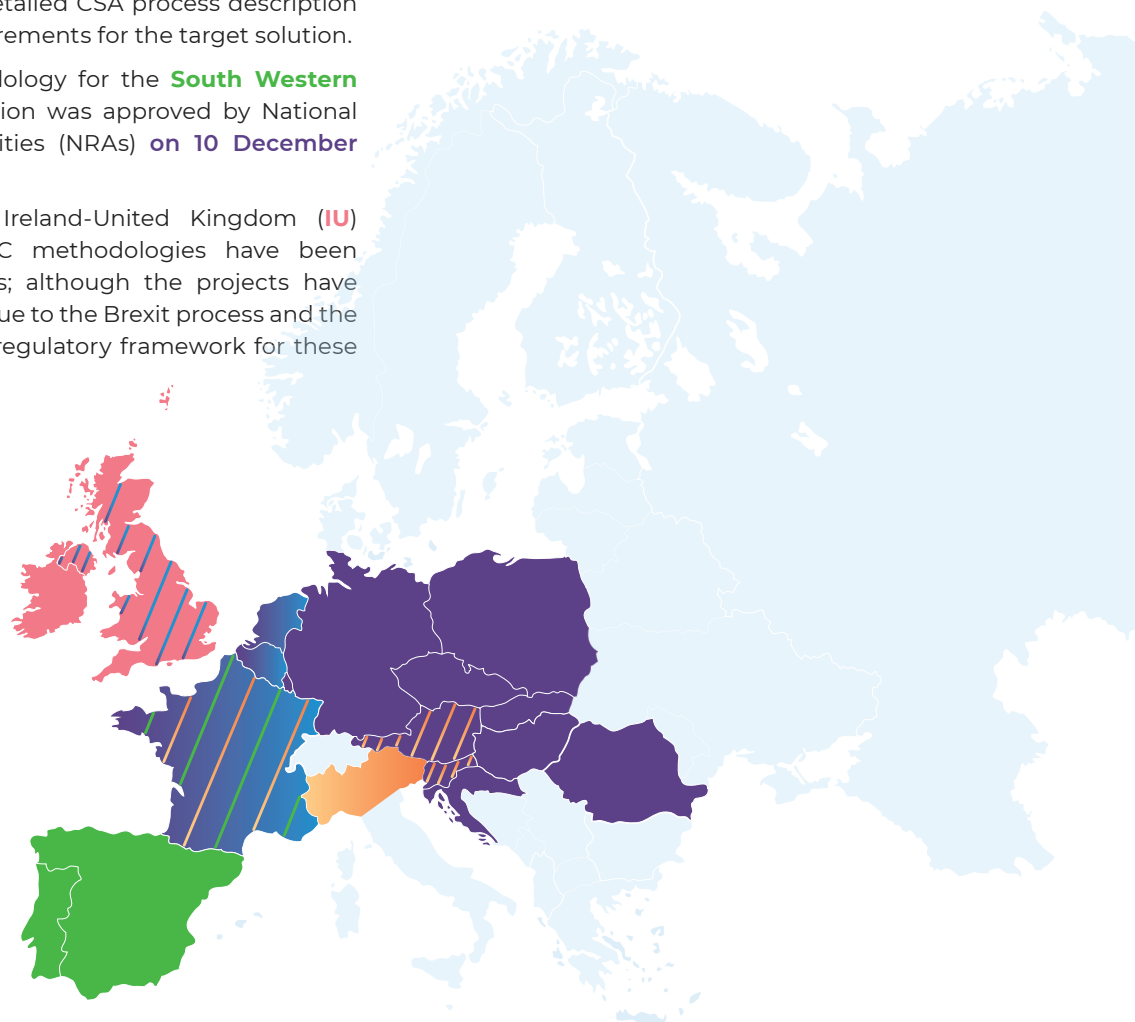
Coordinated Security Analysis (CSA) is a regional process, yet, the regulation requests also an alignment on **Pan-European level**. In 2020, Coreso supported TSOs in amending the CSA methodology (Pan-EU methodology). To ensure further consistency between

CCRs, Transmission System Operators (TSOs) and Regional Security Coordinators (RSCs) have found it useful to draft common requirements for CSA tools and to support the harmonization of the data exchange.

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CSA Methodologies for Regional Operational Security Coordination

- On 4 December 2020, the Agency for Cooperation of Energy Regulators (ACER) released a decision related to the implementation of CSA services in the **CORE** Capacity Calculation Region (CCR): a stepwise implementation has been decided and is laid in the regional methodology called Regional Operational Security Coordination (ROSC).
- If the implementation of the CSA service in the **Italy North** region will contain a stepwise approach is currently under discussion and will be decided in 2021. Currently Coreso is actively supporting the definition of the detailed CSA process description and business requirements for the target solution.
- The ROSC methodology for the **South Western Europe (SWE)** region was approved by National Regulatory Authorities (NRAs) on 10 December 2020.
- In **Channel** and Ireland-United Kingdom (**IU**) regions, the ROSC methodologies have been approved by NRAs; although the projects have been put on hold due to the Brexit process and the absence of a new regulatory framework for these regions.



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HVDC ALEGrO Connection

The new High-Voltage Direct Current (HVDC) connection between Germany and Belgium (1000 MW), named ALEGrO ("Aachen Liège Electricity Grid Overlay"), went technically live on 2 October 2020. From that moment Coreso has included the cable within the Security Analysis processes.

On 17 November 2020, the ALEGrO DC interconnector had its commercial go live in the day-ahead electricity market.

- The CSA team ran a dedicated project to integrate the new connection in the SA day-ahead process.

- On the Capacity Calculation side, to support this go live and its impact on the Central Western Europe (CWE) Capacity Calculation processes and the services Coreso provides for the CWE Capacity Calculation Region (CCR), major tooling developments, procedure updates and operator trainings were executed on time, which have contributed to a smooth launch.

Prior to this commercial go live, Coreso also supported CWE TSOs assessing the impact of ALEGrO via the ALEGrO External Parallel run, executed between 6 May and 17 November 2020, by performing the role of merging entity.

Following the successful go live in the day-ahead electricity market, providing capacities were introduced smoothly on 8 December 2020 in the intraday market.



Coordinated Capacity Calculator Nomination in Italy North Region

31
JAN

CCC Service



Coreso is appointed as Coordinated Capacity Calculator for Italy North CCR. **On 31 January 2020**, Coreso and TSCNET were both nominated as Coordinated Capacity Calculator for this region.

Capacity Calculation Day-Ahead CORE

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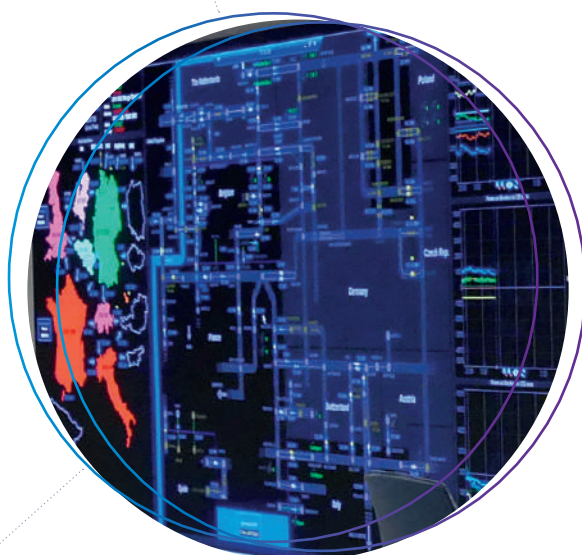
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In the Capacity Calculation day-ahead CORE project, CORE TSOs together with Coreso and TSCNET RSCs started an Internal Parallel run, **on 19 February 2020**, during which the Capacity Calculation (CC) process was executed by experts.

Once the process reached sufficient maturity, Coreso operators joined the project **on 16 August 2020** to support the CORE region by operating the CC CORE tool in collaboration with our TSCNET colleagues, and by providing the Net Position Forecasting and Common Grid Model merging service.

On 15 November 2020, CORE TSOs made a progressive start with the External Parallel run during which the Capacity Calculation results deemed representative have been published, with the objective to provide results for seven business days a week, after the first quarter of 2021.



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Capacity Calculation Long-Term Methodologies for Italy North and CORE CCRs

End of November 2020, CORE TSOs agreed to submit a Capacity Calculation long-term methodology, considering the Flow Based Explicit allocation as a basis.

On 15 December 2020, NRAs approved the Capacity Calculation Long-Term for Italy North (CC LT Italy North) and the Italy North Splitting Cross Zonal capacity methodology, without requesting any amendment (NRAs directly amended the approved documents). Starting from this date, Italy North TSOs and Coordinated Capacity Calculators have 12 months for developing and implementing a process in adequacy with the approved methodology.

Go live of STA and OPC Pan-European Tool

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STA & OPC Services

System Operation Guideline (SOGL) driven from EU regulations, and RSCs Multilateral Agreement identified a need for a Coordinated Short Term Adequacy Assessment Process (STA) and Outage Planning Coordination (OPC) at a Pan-European level, across the different RSCs.

As a result, two cross-regional processes have been developed:

- The **OPC cross-regional process** has been defined pursuant to Article 80 (and Articles 82 to 103) of SOGL, whereby TSOs and RSCs are mandated to collaborate for the performance of outage coordination in order to monitor the availability status of the relevant assets and coordinate the availability plans to ensure the operational security of the transmission system.
- The **STA cross-regional process** has been determined in compliance with Article 81 (and Articles 104 to 107 for TSOs) of SOGL, whereby RSCs are mandated to perform adequacy assessments for at least the week-ahead timeframe, on the basis of the information provided by the relevant TSOs. The objective consists in detecting situations where a lack of adequacy is expected and delivering the results together with the proposed actions to mitigate the risks.

The OPC Pan-European tool was launched **on 31 March 2020** while STA Pan-European tool went live **on 4 May 2020**. The launch of these two operational processes is a big achievement as they are the first processes on those timeframes run by RSCs so far, and on a Pan-EU scale.

Electricity Crisis Scenarios

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In 2020, Coreso answered ENTSO-E's call for nomination to participate in the "Identification of Regional Electricity Crisis Scenarios" report elaboration. One of the major contributions of Coreso is the development of tool to allow for a seamless creation of Pan-European crisis scenarios based on each TSO input. With the coronavirus health crisis this year, this document appears to be particularly relevant as it aims to provide

insight into risks the grid is exposed to. The document was approved by the ENTSO-E System Operation Committee (SOC) **on 3 September** and submitted **on 7 September 2020** to the concerned TSOs, RSCs, competent and regulatory authorities as well as to the European Electricity Coordination Group (ECG).

Implementation of Post Event Analysis Dedicated Organisation

The Post Event Analysis (PEA) process has been established within Coreso to ensure continuous improvement of services provided to our stakeholders, in line with the Coreso focus on operational excellence. Three PEA key outputs are used within the company:

- **Case study discussions:** Allow colleagues in the Operations department to assess complicated situations in unstressed circumstances and facilitates effective discussion about the actions taken.
- **Identification of root causes and good practices:** Provides a framework to discuss the root cause of events and good practices, making all colleagues aware of these practices.

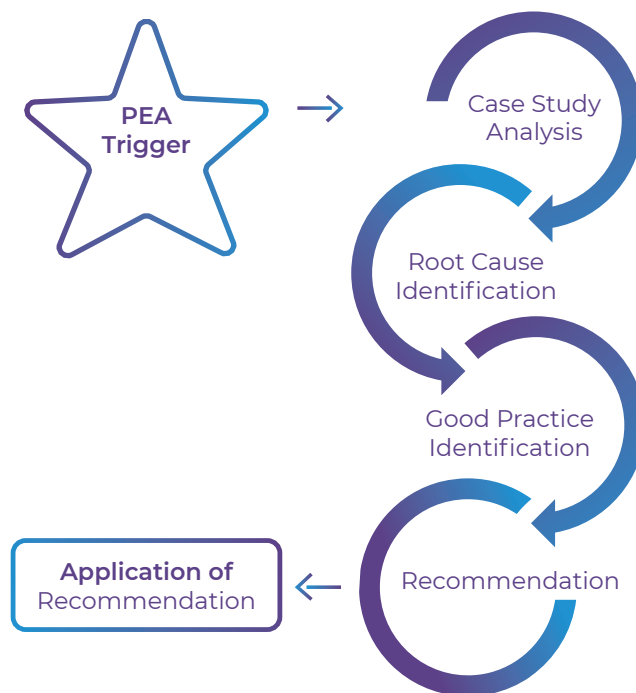
- **Continuous improvement:** Ensures as the final step that the studies outcomes are turned into a recommendation and applied to improve standard operational work.

The PEA team is made up of two members, Róisín Mossop as a referent and Fernando Ballesteros as a lead, who work in collaboration with colleagues both within Coreso and external stakeholders to provide useful recommendations across all processes.

“ The scope is not only to carry out post event analysis studies on incidents in the transmission network in Europe, but also on processes and IT events related to operations.”

The team seeks recommendations based on the studies performed, shares the findings with the suitable audience and finally monitors the implementation of recommendations.”

THE PEA TEAM



Replacement of UPS Batteries to Ensure Service Continuity

8
JUL

In case of an electricity power cut at our headquarters, Coreso should be able to deliver services to their stakeholders 24/7: an uninterruptible power supply (UPS) system was therefore installed in 2009 with eight hours' autonomy. Regular yearly maintenance in Q3 2019 showed that UPS fans and 144 batteries in total will have to be changed due to their lifespan (10 years) being reached. EATON company, also in the charge of maintenance, carried out tests and the results showed there was no need for power/capacity increase despite the business evolution of Coreso.

Prior to the works, careful planning and organisation of operational activities had to be performed, as there would not have been UPS backup in case of main power supply cut (in that case backup and remote operation mode would have been activated).

On 8 July 2020, works were successfully carried out by EATON and A&M companies to replace the UPS system fans and 144 batteries. Besides, no operational issues were identified during that time and normal UPS system operations were tested and activated again.

Upgrading and Future-Proofing the Coordination Room

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As part of Coreso's commitment to operational excellence, upgrading and future-proofing the coordination room was identified as a key milestone to improve operational processes and to enable our operators to perform their processes with a higher efficiency.

Due to the introduction of new Pan-European processes, the number of operators has indeed continuously increased within the last years. New shifts for the Security Analysis day-ahead for the SWE and Channel regions, as well as the ones for the Capacity Calculation day-ahead for SWE have increased the number of operators working simultaneously in the coordination room up to seven in the evening peak.

As a result, with these additions and more coming soon, the coordination room could not accommodate all operators anymore. However, it seemed important that all operators could work within eyesight of each other to lower communication barriers and to improve the general team cohesion.

The project was initiated in 2019, the refurbishment works were performed **between 3 November and 23 December 2020** by Vinci Facilities. **Since 11 January 2021**, the Coreso Operators are back in the new coordination room.

Coreso coordination room benefits now from the following improvements:

- The open floor layout from one side of the building to the other ensures maximum daylight enters in the coordination room.
- The upgraded air conditioning units create a permanent comfortable and welcoming atmosphere, solving a recurrent heat issue.
- Social distancing between each desk is guaranteed thanks to specific improvements.
- The additional space gives each operator more opportunity to set up their workspace to their personal preferences, and leaves space for future adjustments when processes evolve.
- Acoustics inside the coordination room has been improved. For this effect, noise-cancelling elements and materials have been used in between the desks.
- To improve security, a sliding door with batch access has been installed.
- A new video wall has been installed. Indeed, it was certainly one of the most important grid visualisation tools in the old coordination room. As it has served Coreso now for many years, it came to the end of its lifecycle and the decision was made to take the opportunity of the refurbishment to change it. The old system was then removed and replaced by a new LED video wall. Thanks to this change, the video wall energy consumption has been reduced by 68%.
- In addition to the video wall, the screens on each desk were also replaced. This standardisation of IT hardware leads to big improvements in maintenance and makes it easier to have spare parts available. Where we had 5 screens per desk before, we are now working with one large 49' screen that allows operators to have the full view on one screen, as well as one 34' screen for standard office applications.



Implementation of an Operational Server to Ensure Service Continuity and Flexibility

The implementation of an operational server was a main part of the upgrade and future-proofing project of our coordination room. Similar to the premises, the IT hardware was also already outgrown by Coreso. As many operational PCs and screens were due for renewal, we took this opportunity to standardise our hardware and systematically change our way of working. The operational server being used for all processes since 11 January 2021, its introduction has brought multiple advantages over the previously used desktop PCs.

- First and foremost, the server can be accessed from home through a **remote desktop connection**. This is a vital improvement to working from home, especially in the context of the COVID-19 crisis. Indeed, operators and office staff have since had a reliable and standardised platform to perform their processes and project work with the full range of all tools available in Coreso.
- Besides, the server can **rebalance the load in real time**. This means that each operator has more computing power available while the overall installed computing power is lower than in a setup with desktop PCs.
- In addition, **changes and updates** can be done **remotely and for all accounts**. This reduces maintenance time significantly since it is not necessary to go from PC to PC applying updates and changes.
- With the desktop PCs gone, **more space** was freed up for the operators. The cables can now be integrated into the furniture, therefore getting rid of any potential trip hazards and improving the workplace safety.
- Finally, **IT security** will be increased by using personal accounts on the server rather than generic accounts on desktop PCs.

COVID-19 Impact on all activities

Coreso was hit by the coronavirus pandemic just as the whole world in early 2020. Thanks to the awareness of our Prevention Advisor, Coreso started raising awareness on hygiene measures from early February.

On 18 March 2020, Belgium went in lockdown: the administrative and office staff were sent home by telework orders. Operation activities initially continued on-site, since Coreso is considered an essential and crucial service critical to the nation. A task force was then set up to follow up, implement and communicate the necessary actions.

From May until October, the health situation in Belgium stabilised: Coreso offices were reopened with an office rotation plan to limit presence at the office, with a strong focus on sustainable measures.

Besides the internet connection and allowance covering various expenses for teleworking, employees were equipped with additional telework hardware and software, like screens and virtual tokens, to comfortably work remotely.

During the different lockdowns, we delivered Easter bunnies, fruit baskets, chocolates, and year-end gifts to homes as a token of appreciation and motivation to all staff.



COVID-19 Impact on Organisation of Shift Activities

Due to the first COVID-19 wave and the implementation of the lockdown in Belgium, a decision was taken mid-March to drastically reduce the staff physically present at Coreso. This challenged us to adapt operational processes, IT infrastructure, shift organisation in less than 2 weeks to have more than 50% of the operational activities performed from home. It was an opportunity that arose to speed up remote access for a number of operational processes.

To perform the remaining activities that must be performed at Coreso premises, the operators worked in separate rooms, shift schedules were adapted from 8h to 12h, and offices were rearranged to be “COVID-proof”.

Shadow shifts stopped during first weeks and were done remotely for some processes. In a second stage, they were done at Coreso premises by using double equipment to maintain social distancing.

For the first semester of 2021, Coreso restricted measures linked to the COVID-19 remain in force to limit and protect employees from a risk of contamination.

COVID-19 Impact on Training

“Due to the COVID-19 situation, the usual way of training, bringing people together in the same room, working on the same screens, explaining, and discussing was no longer possible.

We had to come up with some new ideas on how we could continue to train our employees despite the sanitary situation. We implemented, step by step, a new way of training for the different types of trainings: theoretical trainings, practical trainings/off-line sessions, double shifts, and continuous training.

For the theoretical trainings, we started to train people remotely, using the communication platform Teams. For some of the courses requiring the trainer to draw schemes and explanations, tactile tablets were ordered so that the trainer could share illustrations with the trainee through Teams. For the off-line sessions, as well as for the double shifts, we ordered new and bigger screens linked together with a cable in order to duplicate the information on the screens: that way, the trainer and the trainee could both see the same information on their screens while managing the same computer with their own keyboard and mouse. This solution enables explanations and discussions without any close contact.

The continuous training, focussing on operational processes, is usually planned once a year in the training room with around 10 participants per session, allowing for a lot of discussion and interaction. However, due to the sanitary situation, we must organise this training via Teams: some guidelines were then implemented to guarantee interactions. Each topic was limited to 75 minutes to ensure trainees could

stay concentrated, with a focus on exercises and quizzes. Besides, an Excel file was shared on SharePoint where each participant could write their answers to different questions: this was a good way for the trainee to stay focused on the questions, and for the trainer to ensure that everybody had answered and understood the questions. With a good balance between topics and breaks, training through Teams was finally perfectly manageable and the Excel file used for participation fulfilled its role by keeping participants concentrated and maintaining good interaction.

Even if it cannot replace a classroom training in most of the cases, remote training is a good alternative considering the health crisis situation. With appropriate material and guidelines, we saw that remote trainings can be easily manageable while enabling interaction.”

STEFFI HECKMANN, RESPONSIBLE FOR OPERATIONS TRAININGS



Learning & Development

Learning & Development at Coreso

During the previous years, the training team in Operations successfully built a standardised process to train individuals from this department. Coreso growing, we welcomed more and more different profiles (from economics to corporate ones). As the training path for Operations is mostly focused on shift activities, it was not possible to integrate these new profiles in the existing training process. It became clear that other trainings needed to be integrated/developed to make sure all the people working at Coreso, having a different expertise and focus, could develop themselves. In 2020, we kicked off the project named 'Learning&Development@Coreso' with clearly defined goals:

- **Technical trainings**
 1. Create an overview of all the existing technical trainings at Coreso (cross department) and identify missing ones.
 2. Appoint internal trainers and make sure these people were appropriately trained to give trainings.
- **Soft skills trainings**
 1. Create an overview of the need for soft skill trainings.
 2. Working together with an external provider specialised in soft trainings who could help us to develop trainings customised for Coreso, to guarantee the quality and to meet the needs gathered in step 1.

In Q4 2020, we created the first training plans for newcomers in other teams (not Operations), which was an important milestone for Coreso.

The project was successfully finalised at the end of 2020 and promises to be a very solid basis to create a genuine Learning and Development culture in the coming years. Indeed, investing in employees' personal development is one of our priorities as it can improve our employees' motivation and commitment but also our company attractiveness.

RCC Training and Certification of Staff

The training and certification of the Regional Coordination Centre (RCC) staff is a Clean Energy Package (CEP) task required by the Article 37 of the Regulation (EU) 2019/943. After having participated in the draft of the Project Initiation Details (PID), project led by ENTSO-E, Coreso has been appointed as Convener to lead the project team. Composed of members from all RSCs, TSOs and ENTSO-E, this team must draft a proposal regarding the way RCCs shall handle training and certification of its staff, in compliance with the regulation's requirements. A proposal shall be submitted to the Agency for Cooperation of Energy Regulators (ACER) before July 2022.

RSC Master Plan Training Project

The RSC Master Plan, which is a working group where RSCs collaborate to align their developments, is hosting a project for common training development. This project, also led by Coreso, has defined a training catalogue listing all modules that RSC would need to train its staff. Besides, it has identified which modules will be common for all RSCs (for example for basic or Pan-European processes). Following the validation of this work by the RSC Working Table (group composed of all RSC Managing Directors or CEOs), the project started a second phase: the implementation of the common modules. In a first assumption, the project team has focused on basis modules (regulatory, stakeholder map) and Pan-European processes modules, as Short Term Adequacy (STA) and Outage Planning Coordination (OPC). These first modules trainings shall be organised by mid-2021.

Professionalisation of the Training Team

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In December 2019 and January 2020, the members of the Coreso training team followed two trainings in order to professionalise their work. The objective of the first training was to learn how to lead and give efficient training, whereas the objective of the second

training was to learn how to build a training support system and how to assess trainees. These trainings enabled our training team to provide better quality training courses and material, and to evaluate trainees objectively and efficiently.



Knowledge Management Framework Project

In 2020, the coronavirus pandemic and related lockdowns have forced many organisations to undergo a jeopardising digital transformation. Remote work started to be the new standard way of working. This new situation stressed more than ever the importance of efficient communication, access to reliable information, knowledge sharing and collaboration across the organisation.

Therefore, Coreso will introduce in 2021 an Information Management policy which will create an organisational structure and standardise Coreso's way of working. The benefits of compliance with this policy will be trusted information and records that are well described, stored in known locations, and accessible to all Coreso's employees and external stakeholders when needed. IM and KM development will be pursued in coming years.

Recognising this need, Coreso launched the **Information Management (IM)** and **Knowledge Management (KM)** project. The purpose of this undertaking is to implement the first IM and KM foundations across the organisation. Moreover, Coreso's employees will be encouraged to use the state-of-the-art information technology as a main information management, knowledge sharing and collaboration tool. Additionally, the use of common taxonomy and metadata will:

- improve consistency of critical business information;
- guarantee single source of truth;
- promote usage of standardised naming convention across the organisation.

Coreso acknowledges the importance of metadata and will facilitate its usage to ensure a more efficient IM which leads to time saving to find key business content and increased productivity in the company.



“Over the first 10 years, the size of Coreso increased with a factor 10 staffing wise.

Finding, recruiting, and training was a challenge successfully completed. For the next 10 years, to be as successful as the first, Coreso needs to change the way it works. If we continue to apply the methods, principles, and practices from 10 years ago, we will soon need an exponentially increasing number of operators and staff.

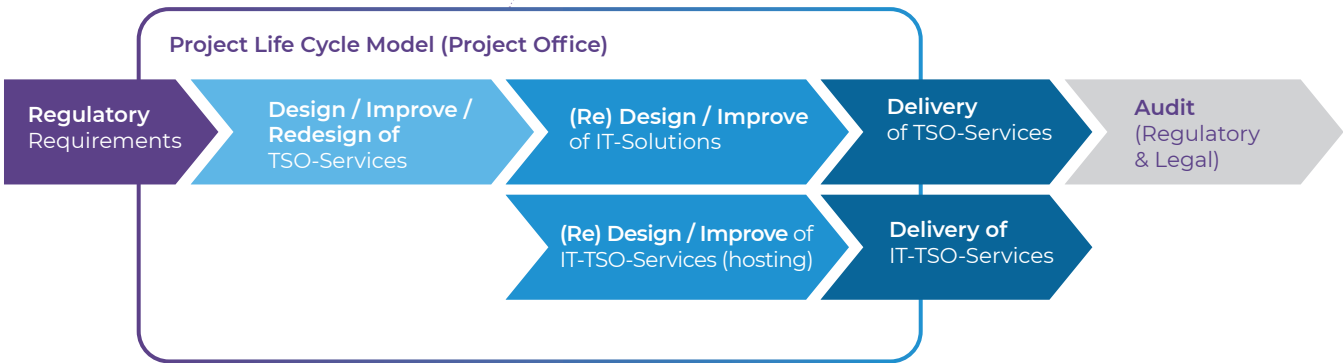
The Transformation Process therefore aims to structure, standardise and automatise the process and the way we work, across regions and services.”

JAN VAN ROOST, CHIEF OPERATIONS OFFICER (COO)



The Coreso value chain was defined, with a stronger focus on **operational excellence**. This means that services and tools should be designed with reusability across regions and services in mind. Besides, we need to use standard and defined working principles, to implement IT Architecture and to build blocks and tools that have been transparently and actively validated upfront. Exception management needs to be set up.

Core processes



Supporting processes



All activities engaged in by Coreso will be checked against “fulfilling regulatory compliance in the right timeframe before committing”.

An organisation with a focus on the right competences and skills for the job, and with more focus on expertise or (project) management, has been created. The basis being the value chain of designing, developing, and finally delivering services.

A larger group of some fifteen senior and experience staff members have worked with the management team on working out the organisation structure.

The aim is to take a first step in early 2021 by further adapting the organisation to be in line with the value change, and further empower the organisation to work against a stable planning and deliverables.

OCT 2020 New IT Manager

Coreso appointed a new IT Manager during the course of 2020: Vincent Martin started in **October** and is bringing a long experience of IT transformation in different sectors to help Coreso face new challenges. He comes from the Banking sector in Luxembourg where he was Head of IT for an online bank. Vincent began his career at Tractebel Engineering in non-European countries planning department before moving to IT and consulting responsibilities.

“Upcoming challenges at Coreso are linked with the company growth and the need to provide structure and predictability.

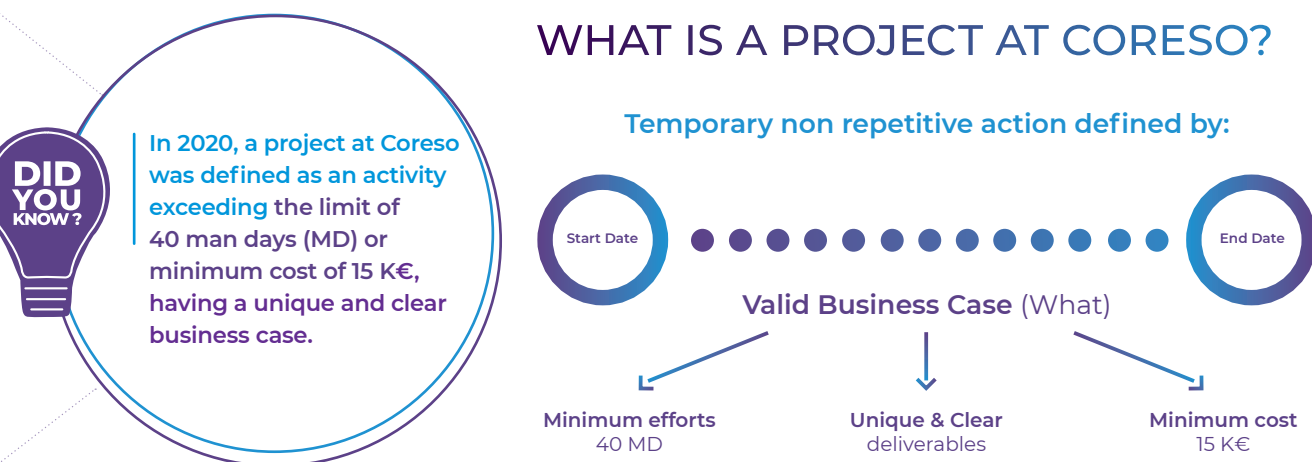
The company’s growth will require more procedures and industrialisation of solution delivery in a secured and flexible manner. IT needs to improve processes from Information Technology Infrastructure Library - a set of best practices and processes - organising IT Service Delivery for existing services, to a Software Development Lifecycle (SDLC) which is fully aligned with the Coreso’s PMO methodology. This will have to be completed while supporting the transformational cooperation projects with external stakeholders in the CorNet Programme setting pressure to speed the delivery of this transformation.”

VINCENT MARTIN, HEAD OF IT DEPARTMENT



2020 was the year of the challenges for the PMO (Portfolio Management Office). Our focus was to keep methodology & tooling perspective as simple as possible.

One of the key developments has been the creation of **a strong baseline to ensure alignment and single point of truth for every project**. With the same objective, reviews were done on a monthly base by the project owners. The involvement of all team members in the project methodology has been an essential factor in the success of the Project follow-up.



Prevention at Work

20
20

2020 was a busy year concerning prevention at Coreso. COVID-19 management measures mobilised several people and were time-consuming to guarantee safe work conditions. Nevertheless, COVID-19 fighting should not shadow other important actions taken to ensure well-being at Coreso, among which:

- A **first-aid team** was implemented mid-February 2020. Twelve colleagues followed a three-days training given by the Red-Cross to be able to correctly intervene in case of health urgency.
- A dedicated analysis was realised and identified the absence of a specific **room for pregnant and breast-feeding workers**. As a result, one of the second floor rooms was transformed and equipped with a lockable door, blinded windows and a sofa to create a more comfortable and private atmosphere. A fridge was also installed.
- An **internal emergency response team** was created: on 21 September, our Prevention Advisor was the first employee to be trained in firefighting. The role of this team consists in ensuring people safety and evacuation in case of alarm as well as guiding and informing fire brigade at their arrival.
- A **Trust Person** (TP) has been appointed and trained during Q4 2020. The TP intervenes at a worker's request for informal or formal procedures. The TP will also work hand-in-hand with the Prevention Adviser to detect and report psychosocial risks at Coreso.

CorNet Highlights

Drawing on their respective regional expertise and given a constantly growing range of their RSCs tasks, both **TSCNET** and **Coreso** have a leading role to play in fostering innovative projects for coordination services and setting the framework for common initiatives within the European energy market.

Thus, the various challenges within the European electricity transmission network have prompted the management of both RSCs to strive for various

initiatives to meet the future responsibilities of RSCs on a strategic and organisational level. In 2020, TSCNET and Coreso launched the CorNet Programme to frame innovative cooperation projects related to the development and implementation of regional security services. The Programme leverages synergies to face highly complex environments of the energy markets as well as new tasks identified in the Clean Energy Package (CEP) becoming part of the portfolio of the future Regional Coordination Centres (RCCs).

RSC Conference 2020

24
NOV

On **24 November 2020**, the fourth edition of the RSC Conference was hosted digitally by the Baltic RSC in collaboration with ENTSO-E, under the theme "Securing future power systems with digital cooperation".

Around 800 participants from European TSOs community, RSCs, EU representatives and academics participated in this event focusing on the digital dimension of TSO regional coordination. Different online presentations and parallel sessions covered the challenges arising from the implementation of the EU Green Deal, notably with regards to the integration of large-scale renewable energy sources and offshore deployment. The implementation of the Clean Energy Package as well as the impact of COVID-19 pandemic on regional risk preparedness scenarios were also discussed during this conference.

The conference materials can be found on the Baltic RSC website: <https://rsc2020.eu/>.



2020 KEY FIGURES

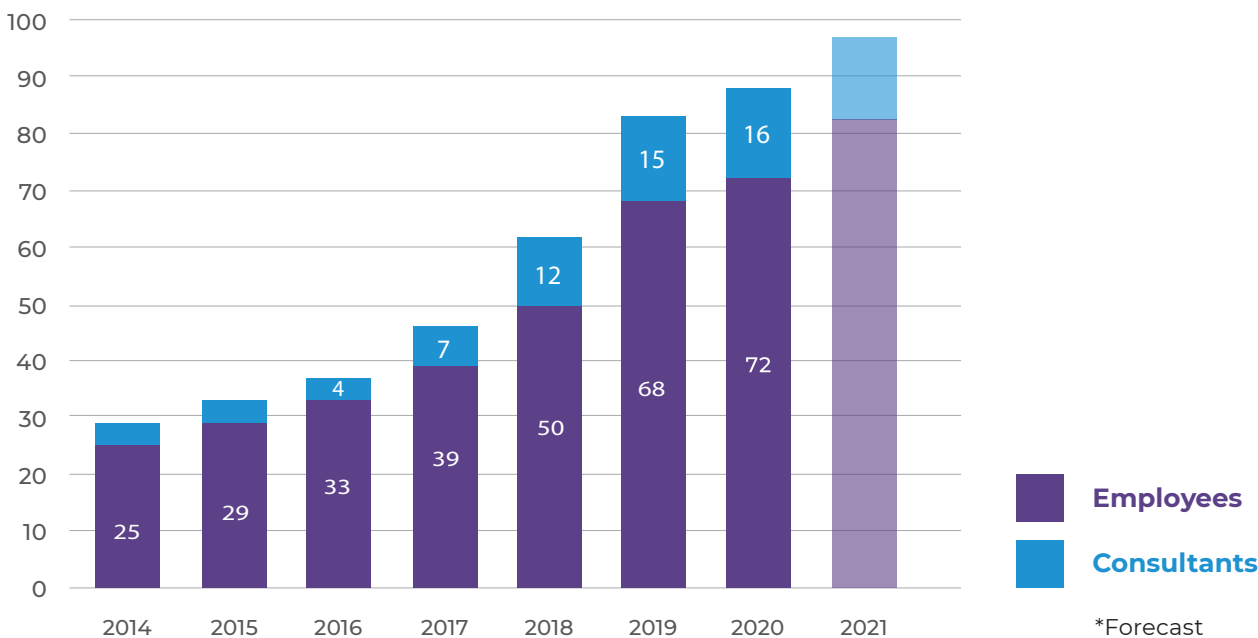
Staffing Competence

1st time Coreso organised a cross-functional “Train the Trainer” training course aimed at all people providing internal trainings.

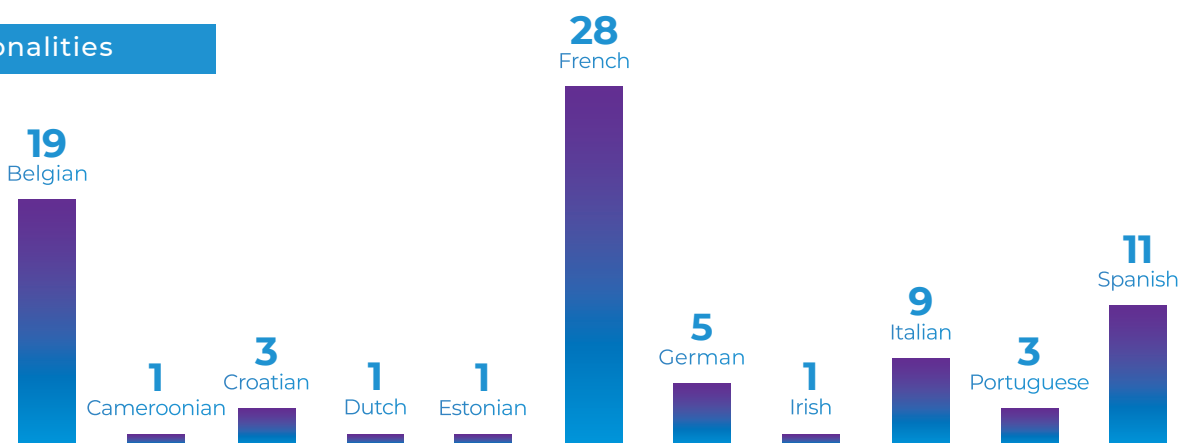
1st time Coreso organised a cross-functional “soft skills” training course, focused on High level impact Communication (Control your mindset, Understand someone else’s standpoint, Communicate to be understood, Communicate to be remembered). This training turned out to be a big success and will be organised multiple times in 2021.

Number of Employees

End of 2019: 68 End of 2020: 72 End of 2021: 82*



Nationalities



Internships

In 2020, we welcomed eight interns who completed internships from three to six months.

36 months

of internships.

in 2020

(one month less than the previous year).

Number of New/Trained Operators

In 2020, we trained:



10 newcomers starting in Team A, following a four-month training.



5 operators going from Team A to Team B, following a two-month training.

DID YOU KNOW?

Coreso operators from Team A focus on operations linked to:

- Short Term Adequacy and Outage Planning Coordination services on a weekly basis.
- Day-ahead activities (Common Grid Model, Security Analysis and coordination).

On the other hand, Team B focuses on:

- Capacity Calculation.
- Intraday activities (Security Analysis, coordination and specific studies requested by our shareholders).

Key Figures from Security Analysis Services Across Regions 2020

| D-1 traffic lights: | CWE | CEE | Italy North | SWE | NGESO |
|--|------|-----|-------------|------|-------|
| Green | 196 | 320 | 169 | 96 | 80 |
| Orange | 142 | 43 | 146 | 130 | 29 |
| Red | 28 | 3 | 51 | 139 | 1 |
| Estimated number of coordinated Remedial Actions (RAs) | 1095 | 45 | 1508 | 2704 | N/A |

 No stress  Coordination required or stressed situation  Coordination needed & stressed situation



Number of Running Processes

| SA (Security Analysis)* | CC (Capacity Calculation) | OPC (Outage Planning Coordination) | STA (Short Term Adequacy) |
|-------------------------|------------------------------------|------------------------------------|--|
| D-1 CWE/CEE | DA CWE | Week-ahead | STA daily |
| D-1 Italy North | DA Italy North | Month-ahead | Regional Adequacy Assessment upon triggering |
| D-1 SWE | DA SWE** | Year-ahead | |
| D-1 NGESO** | ID Italy North | | |
| ID CWE | ID CWE potential capacity increase | | |
| ID Italy North | | | |

DA/D-1: Day-Ahead - ID: IntraDay

* SA vs CSA: Since 2009, the SA services in Coreso have been set up bilaterally with the TSO shareholders. With the implementation of the CSA program, the SA services will gradually evolve onto the SOGL compliant CSA service.

** Process using a CGMES format model.

Volume of Renewable Energy in Some European Countries

The installed capacities of renewable energy in the operational area of each of Coreso's shareholders.

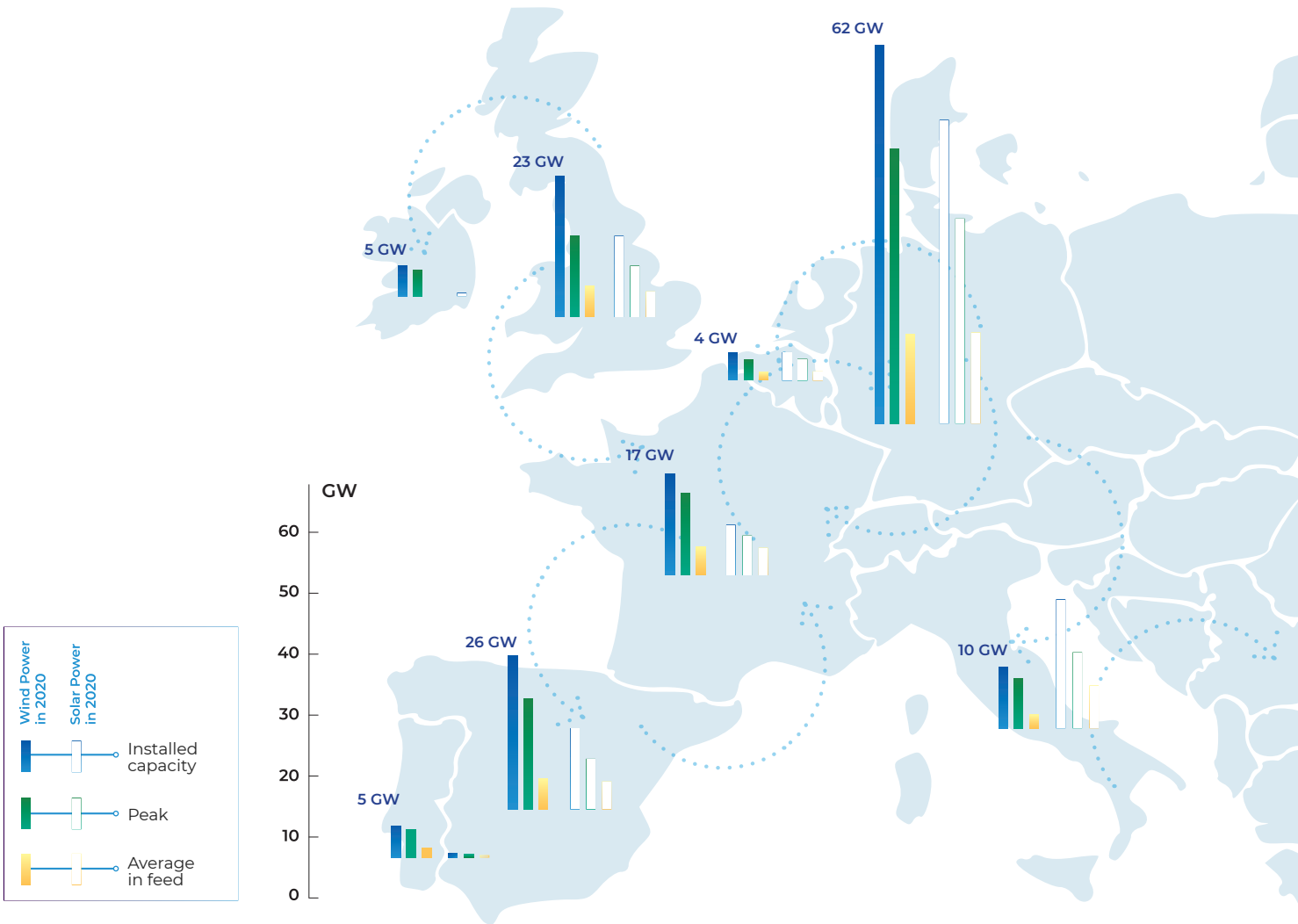
Wind

| Country | Installed capacities of renewable | Average | Peak |
|----------------|-----------------------------------|---------|-------|
| DE | 62 GW | 15 G | 46 GW |
| BE | 4 GW | 1 G | 3 GW |
| FR | 17 GW | 4 G | 13 GW |
| IT | 10 GW | 2 G | 8 GW |
| ES | 26 GW | 6 G | 19 GW |
| PT* | 5 GW | 2 G | 4 GW |
| UK* | 23 GW | 5 G | 13 GW |
| Ireland island | 5 GW | N/A | 4 GW |

Solar energy

| Country | Installed capacities of renewable | Average | Peak |
|----------------|-----------------------------------|---------|--------|
| DE | 50 GW | 15 G | 33 GW |
| BE | 4 GW | 1 G | 3 GW |
| FR | 9 GW | 4 G | 7 GW |
| IT | 21 GW | 7 G | 12 GW |
| ES | 13 GW | 4 G | 9 GW |
| PT* | 0.9 GW | 0.5 G | 0.6 GW |
| UK* | 13 GW | 4 G | 9 GW |
| Ireland island | 0.036 GW | N/A | N/A |

* 2019 figures



Projects were initiated in 2020:

- 19 for Service Development
- 11 for IT
- 9 for Corporate
- 3 for Operations

11 Projects were accomplished in 2020 and 16 Projects were planned to be completed in Q1 2021. Projects data are now stored in one single place, which enables the development of consistent reporting. Besides, timesheets are another tool that have successfully been implemented and that will be enhanced to better trace Coreso activity. Indeed, it will ensure a clear follow-up on our activities and transparency related to cost of Project/operational activities, based on actual figures and data coming strictly from these resources. As a result, timesheets help Coreso management, and indirectly the shareholders, to have a clear vision on the right use of our resources within a clear financial transparency.

Time for Some Timesheet Figures

Coreso in 2020:

16K days logged (60/91 FTE)

16,148

Total

Training days

32 70 1,262 93

Corporate

IT

Operations

Service Development

Coreso in 2020 per activity



Admin & Training

Daily activities per department

Management

Project

EUROPEAN REGULATION AND COMPLIANCE CONTEXT

Transition to RCC

1. Regulatory Framework

The EU Regulation on the internal electricity market (Regulation (EU) 2019/943) which is part of the Clean Energy Package (CEP) calls for a higher coordination between TSOs at a newly established regional level - the System Operation Regions (SORs). The enhancement of the coordination between TSOs will be carried out through the establishment of **Regional Coordination Centres (RCCs)**, which shall be established in each System Operation Region (SOR) and take over the role of RSCs by July 2022.

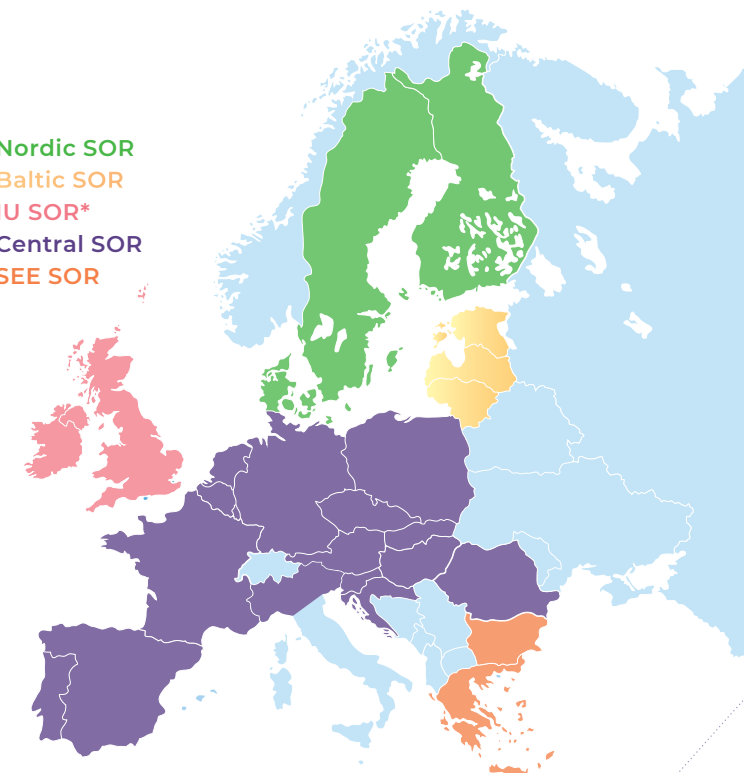
RCCs will not manage the electricity system which remains under control of TSOs. Yet, the Regulation entrusts the RCC to play a larger role in the coordination. For instance, when Coreso performs an analysis or provides results related to a specific service, it shall share the analysis or the results not only with the TSOs receiving the service in given SOR, but also with other TSOs receiving the service and RCCs in the neighbouring SORs.

On 6 April 2020, the Agency for the Cooperation of Energy Regulators (ACER) published a decision¹ on the geographical scope of the RCCs and defined the five so-called SORs.

RCCs IN CENTRAL SOR

Central SOR TSOs submitted a proposal to establish **Coreso and TSCNET** as Central SOR RCCs.

1. Nordic SOR
2. Baltic SOR
3. IU SOR*
4. Central SOR
5. SEE SOR



The Clean Energy Package CEP is a set of rules aimed to update the European energy policy framework in order to facilitate the transition away from fossil fuels towards cleaner energy, and to deliver on the EU's Paris Agreement commitments for reducing greenhouse gas emissions. The Clean energy for all Europeans package consists of eight legislative acts.

- Energy performance in buildings;
- Renewable energy;
- Energy efficiency;
- Governance regulation;
- Electricity market design elements consisting of four legislative acts:
 1. New electricity regulation (Regulation (EU) 2019/943);
 2. Amending electricity directive;
 3. Risk preparedness;
 4. Regulation outlining a stronger role of ACER.

DID YOU KNOW ?

¹ ACER Decision 10/2020

*Definition of IU SOR could be revised after Brexit's outcome.

2. RCCs in Central SOR

In January 2021, Central SOR NRAs approved the proposal “Central RCC Establishment Provisions” that was submitted by the 20 TSOs of Central SOR in July 2020. **Therefore, Coreso and TSCNET will be the two RCCs for Central SOR.**

During the process of the drafting and the approval of the proposal, the Central SOR TSOs have consulted and closely cooperated and coordinated with Central SOR NRAs and ENTSO-E. Coreso and TSCNET were involved in this process to support TSOs in the development of the proposal. Furthermore, Coreso has made its SharePoint available to all TSOs to work on the proposal.

In practical terms, as from January 2021 till 1 July 2022, Coreso (as well as TSCNET) is in a transition phase to become RCC by adapting its functioning to comply with the requirements of the Regulation (2019/943). Indeed, EU legislation regarding regional coordination in the electricity sector were built from a bottom-up approach by capitalising on existing initiatives. Furthermore, the Central SOR NRAs stipulated in their decision that “they deemed to monitor the transition from existing RSCs to future RCCs by 1 July 2022 due to the importance of this RCC establishment proposal which impacts all European TSOs whose coordination is essential for the proper functioning of the electrical system.”

“As future RCCs of Central SOR, Coreso and TSCNET were strongly involved in the Central RCCs Establishment project

and their support was really valuable, among others to establish common provisions for both RCCs on Organisational and Financial arrangements and Liabilities, which were welcomed by Central NRAs.”

VALENTINE WOILLEZ, SYSTEM OPERATION PROJECT MANAGER AT RTE



The discussion between the Central SOR TSOs and NRAs were often challenging since Central SOR covers among others 2 RCCs, TSOs not yet shareholder of an RCC and a shareholder which is no Central SOR TSO.

All 20 TSOs can be proud of the outcome and the approval by NRAs.”

CINDY BASTIAENSEN, OPERATIONAL PLANNING NCC MANAGER AT ELIA

“In the RCC Establishment proposal, the TSOs together with Coreso and TSCNET managed to lay down foundations for future RCCs

and the necessary processes to carry out their tasks, despite the many unknowns including the methodologies for those tasks. RCCs and TSOs can build on these when implementing the tasks in the years ahead.”

MARTIN PISTORA, TEAM MANAGER AT ČEPS



Toward RCCs in Central SOR

Statutes and participating TSOs

On a corporate level, the “Central RCC Establishment Provisions” do not impact the governance of Coreso nor its Statutes. However, it indicates that “the Statutes of Coreso may be reviewed if needed to take into account its role for IU SOR in the light of the Brexit outcome.”

The proposal designates participating TSOs as the TSOs belonging to the Central SOR defined in ACER’s SOR Decision.

- The TSOs of the Central SOR participating in Coreso are: 50Hertz, Elia, REE, REN, RTE and TERNA.
- The TSOs of the Central SOR participating in TSCNET are: 50Hertz, Amprion, APG, ČEPS, ELES, HOPS, MAVIR, PSE, SEPS, TenneT DE, TenneT NL, Transelectrica and TransnetBW.
- Creos and VUEN, which are currently neither participating in Coreso nor in TSCNET, will have to participate in Coreso or TSCNET by July 2022, by either becoming a shareholder or by a specific arrangement concluded between these TSOs and the RCCs. This will lead to an amendment of Central RCC Establishment Provisions to be submitted to Central NRAs by January 2022.

IU TSOs will also participate in Coreso. The conditions for this participation will be defined in the IU SOR RCC establishment proposal.

Organisational and Financial Arrangements

The organisational arrangements and the financial arrangements for Coreso shall be defined according to the relevant company law starting from the already established working frameworks.

Cooperative Process

The Regulation (2019/943) entrusts RCCs to establish an agreement with TSOs and other RCCs by requesting the development of cooperative processes for each task. In the “Central RCC Establishment Provisions”, the cooperative process and eventually the working arrangement are contracts or high-level business process descriptions where roles and responsibilities of TSOs and RCCs are determined in line with the legislations and methodologies. The working arrangement covers the procedure of consultation as well as the procedure of coordinated action or recommendation.

Performance of the Tasks

RCC should perform the task:

- in accordance with the already established and future methodologies for the tasks already covered by the relevant network codes or guidelines or by the Electricity Regulation; or
- in accordance with future proposals according to Article 37(5) of the Regulation (EU) 2019/943 when developed by the ENTSO-E for Electricity and approved by ACER.

For tasks to be performed by Coreso and TSCNET on a rotational basis, the proposal specifies for each task the responsible RCC and the backup RCC.

What could be the RCC tasks?

| RCC tasks covered by network codes | | New Tasks for RCC | | Tasks not delegated by ENTSO-E | Tasks under discussion |
|------------------------------------|----------------------------------|--|--|---|--|
| Common Grid Model | Coordinated Capacity Calculation | Regional sizing of reserve capacity | Facilitating the regional procurement of balancing capacity* | Identification of regional electricity crisis scenarios | Supporting coordination & optimisation of regional restoration |
| Defense plan restoration (ER) | Coordinated Security Analysis | Training | Calculating max. entry capacity* | Seasonal adequacy assessment | Supporting optimisation of inter-TSOs settlements |
| Short Term Adequacy | Outage Planning Coordination | Carrying out post-operation and post-disturbances analysis | Supporting in identification of new transmission capacity * | | |

* Task either upon request or development of proposal under discussion

Compliance of the Services

Coreso aims to be successful by maintaining a culture of integrity and compliance with the evolving European legislation and regulation, thanks to the implementation of an internal compliance programme and process.

An internal audit was conducted to review if the design and implementation of the process are adequate, and if roles and responsibilities are well defined. The audit also assessed the approach and working method of

Regulatory Activity at Coreso, which is working on determining the compliance maturity and gap analysis for every process and service. The audit concluded that *"in general and given the size and the nature of the Coreso organisation, Internal Audit notes that the design of the process is well elaborated and well documented. Some remarks and suggestions of Internal Audit were immediately integrated into the governance documentation."*

OUR SERVICES

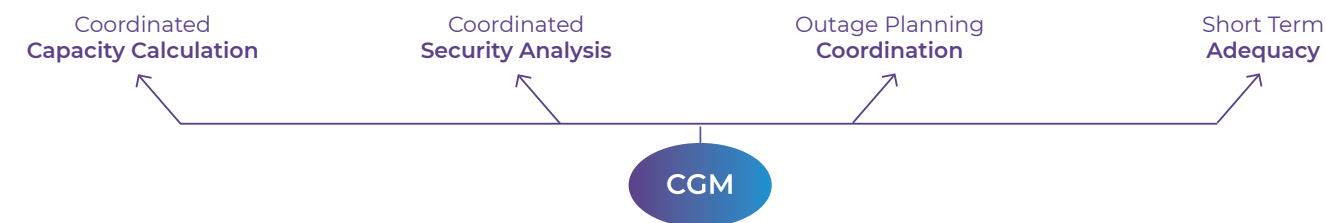
Service 1: Common Grid Model

CGM Introduction

To allow operational coordination and to ensure security of supply on a European level, TSOs share information with RSCs. Each TSO publishes its model which is the representation of its electricity grid. This model is called an Individual Grid Model (IGM). Afterwards, RSCs merge these IGMs to create a **Common Grid Model (CGM)** which represents the European electricity network.

Thanks to this process, all European TSOs and RSCs benefit from the same overview on the Pan-European electricity network and the same accurate view on the flows of high-voltage lines.

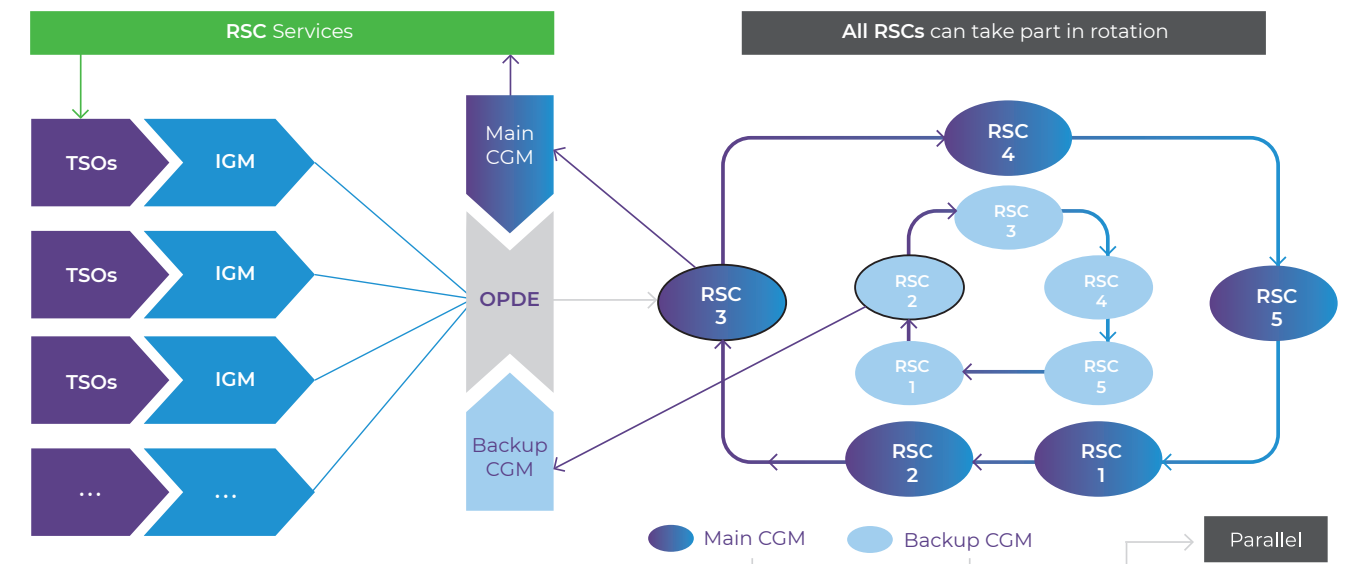
Besides, the CGM is used as a basis allowing TSOs and RSCs to run most of their services derived from network codes such as Coordinated Capacity Calculation, Coordinated Security Analysis, Outage Planning Coordination and Short Term Adequacy.



To be more precise, the CGM service consists of:

1. A process to create a CGM by merging IGMs from 40 Pan-European TSOs.
2. The use of a harmonised data format allowing precise description of the network (CGMES).
3. The exchange of files supported by the Operational Planning Data Environment (OPDE) which is a platform to exchange data and which contains central business applications to support RSC services.

TSOs provide IGM on OPDE. RSCs can retrieve these IGMs from OPDE in order to create a CGM and provide this CGM back on OPDE. The participation to the CGM creation process by the RSCs shall be based on a rotational principle on an agreed calendar date, with provision of a CGM by one main RSC and one backup RSC at all times.



The creation of the CGM is a legal obligation derived from the three following network codes:

- Article 17 of Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on Capacity Allocation and Congestion Management (CACM).
- Article 18 of Commission Regulation (EU) 2016/1719 of 26 September 2016 establishing a guideline on Forward Capacity Allocation (FCA).
- Articles 67(1) and 70(1) of Commission Regulation (EU) 2017/1485 of 02 August 2017 establishing a guideline on electricity transmission system operation (SOGL).

Besides, the CGM process is legally described in the CGM methodologies (CGMM v1 plus for CACM, CGMM v2 plus for FCA and CGMM v3 for SOGL) approved by National Regulatory Authorities (NRAs).

The CGM service is being provided in different timeframes. While some of these timeframes are made mandatory by the network codes, others can be defined at a regional level. The supported timeframes are:

- Year-ahead;
- Month-ahead – not in scope for the go live in 2021;
- Week-ahead – not in scope for the go live in 2021;
- Two-days-ahead;
- Day-ahead;
- Intraday.



Service Governance

The **ENTSO-E CGM Programme** objective is to ensure that Pan-European Common Grid network Models can be delivered in line with the network code requirements under SOGL mainly. This includes:

- 1 Implementation of Common Grid Model Exchange Standard (CGMES) to be used by TSOs and RSCs to produce IGM/CGM.
- 2 Design and implementation of ICT systems to allow data exchange and provide compliance with CGM security plan.
- 3 Description of the CGM Building process in the Common Grid Model Methodologies (CGMMs).

The CGM Programme has existed since 2016 and is governed by the **CGM Executive Steering**. RSCs are there represented on a rotational basis. Other members are: ENTSO-E System Operation Committee (SOC) chair, ENTSO-E secretary general, ENTSO-E CIO, head of CGM Programme, Business Lead Manager and ENTSO-E ICT Manager. Coreso fills the role of **Business Lead Manager** of the Programme, being responsible for the delivery and approval by ENTSO-E SOC of key documents.

Moreover, Coreso experts took an active role in the **CGM Building Process and the CGM Solution Design working groups** within ENTSO-E, with focus on:

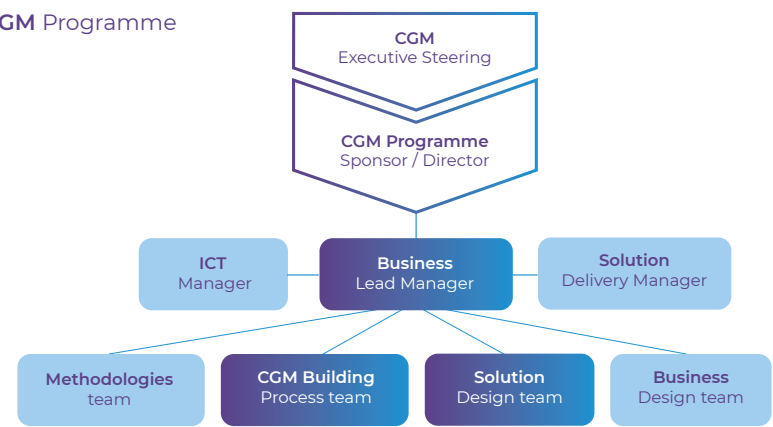
- Drafting quality documentation, which is key to improve quality of IGM/CGM modelling.
- Drafting Business Requirements and Change Requests to ensure OPDE applications fit for the CGM Building process.
- Testing Interoperability of models and applications.
- Testing readiness of CGM Building process & OPDE applications.

In 2020, Coreso service engineers were in close contact with the CGM managers of their shareholders to:

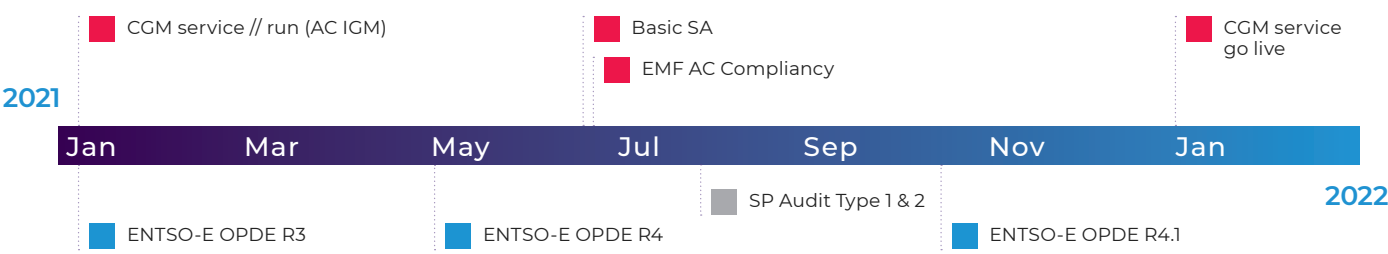
- Follow up on the status of ENTSO-E CGM Programme.
- Align on the Coreso CGM Service Roll-out plan.
- Clarify requirements TSOs must reach and current TSO Shareholder readiness.
- Provide feedback on the IGM quality modelling.

To meet the aforementioned objectives, Coreso hosted a TSOs Shareholders workshop on 26 October 2020.

ENTSO-E CGM Programme



Timeline



The go live of the CGM service is foreseen for the end of 2021. The ENTSO-E CGM Programme is committed to this date and where necessary prioritisation of scope takes place.

To ensure go live readiness, ENTSO-E foresees different releases of OPDE during 2021 to cover “must have” change request of OPDE applications: Release 3 in Q1 2021, Release 4 in Q2 2021 and Release 4.1 in Q3 2021.

Since the end of 2019, Coreso is merging CGMES files on a daily basis and providing these on OPDE (see below the section dedicated to CGM service in CGMES parallel run for more details).

Starting from mid of 2021, Coreso will run a “Basic Security Analysis Process” on a daily basis which is an opportunity

to use CGMs on short term generated every day in the CGM Building Process. Making these results available to shareholders will help to further assess quality of IGM/CGM.

By mid 2021, we expect our European Merging Function (EMF) tool to reach AC EMF Compliancy, which means that our EMF tool shall reach correct load flow results for all standard AC equipment. Provision of detailed High-Voltage Direct Current models has been deferred to 2022 and is therefore out of scope of the CGM go live.

Finally, all TSOs, RSCs and ENTSO-E CGM Programme are obliged to conduct audits in order to be compliant with the Minimum Viable Solution (MVS) Security Plan before launching the CGM program.

CGM Service in CGMES Parallel Run

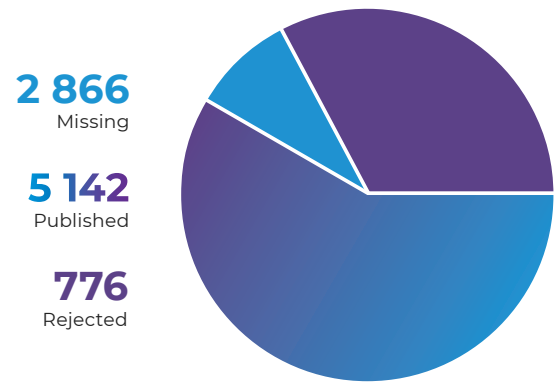
Since the end of 2019, Coreso is able to create a topological merge on CGMES IGMs with sufficient quality. In 2020, Coreso merged the day-ahead CGMES IGMs available from OPDE on daily basis, and provided back the CGMs resulting from this process on OPDE. This process was successfully managed and monitored by project engineers.

After a year spent in the project team testing our capability to merge IGM files, an internal Coreso CGM parallel run was launched on 1 December 2020 during which the merging process was monitored and managed in shift by operators at target hours for two-days-ahead, day-ahead and intraday timeframes.

In total, during 2020, **more than 5000 CGMs** were created in a CGMES format and published successfully on OPDE.

On some days, CGMs could not be published on OPDE: analysis of these cases led to improvements on OPDE validation engine, OPDE performance, IGM quality and EMF merging performance.

Day-ahead CGM Publication on OPDE in 2020



Year-Ahead CGMES Merging

On 12 February 2020, ENTSO-E System Operations Committee (SOC) approved Terms of Reference of the year-ahead (Y-1) Scenarios Task (Y-1 grid forecasting). In this context, the created Y-1 CGM was tested in Q4 2020 for selected 2021 scenarios. All TSOs selected Winter scenario 2021 as input data for the test and, for the first time, the Y-1 CGM was created using CGMES format. A report presenting the test's results was then submitted in February 2021 to SOC for approval. This report will be a basis for the decision on plans for 2021, about the creation of the year-ahead scenarios for 2022.

Besides, a Service Level Agreement was prepared between ENTSO-E (who signed the agreement on behalf of TSOs), Coreso and Security Coordination Centre (SCC). Those two RSCs shall indeed support the tests related to:

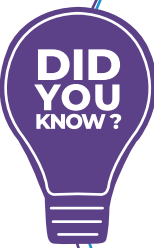
- IGM creation and update;
- IGMs publication on the OPDE platform;
- CGM merge;
- CGM validation.

Service 2:
Coordinated Security
Analysis

CSA Introduction

Coordinated Security Analysis (CSA) is one of the major RSC's services. The objective of the CSA process is to detect and resolve potential operational security violations on the grid, for the day-ahead and intraday timeframes. As a result, RSCs will perform analysis and recommend remedial actions to TSOs to solve the identified constraints. In case of a violation of operational security limits on cross-border relevant network elements, multiple measures in multiple TSO networks may be necessary. A close coordination between TSOs and RSCs is then essential to ensure the most effective and economically efficient Remedial Actions (RA).

When the operational security violations have been resolved in each region, the residual violations in the overlapping zones between regions will be

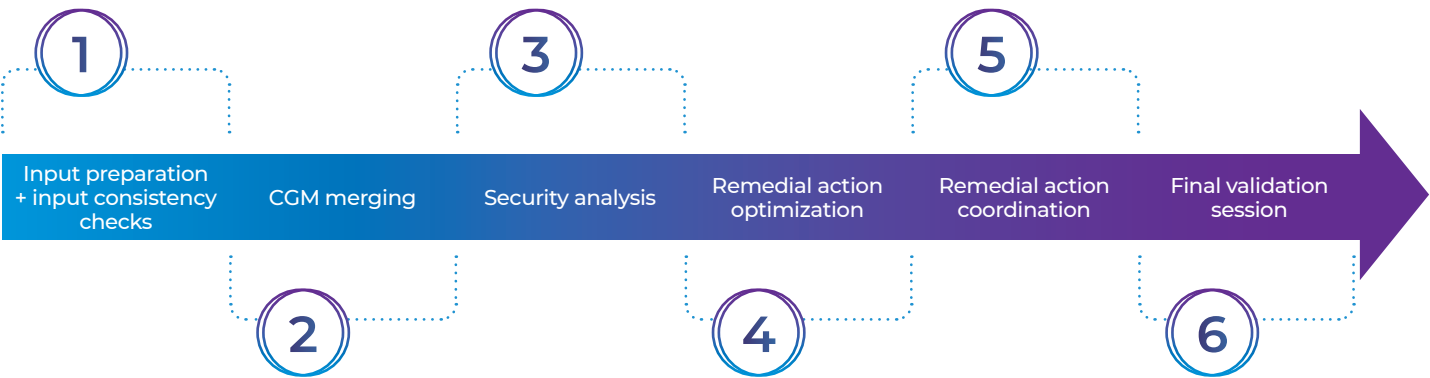


A violation of operational security limits is a flow that is above the capacity of a circuit and that needs to be reduced to an acceptable level. To enable RSCs to perform the CSA service, the CSA process requires TSOs to provide RSCs with different inputs:

- Their Individual Grid Models (IGMs) that will be merged into a Common Grid Model (CGM);
- The list of their assessed elements;
- The contingencies that need to be simulated;
- The available Remedial Actions (RAs).

addressed through a cross-regional process. This process is defined in the first amendment to the CSA methodology that is due ACER approval in June 2021.

Six main steps of the CSA process



In day-ahead timeframe, steps 1 to 5 are performed twice, followed by one final validation session.

Service Governance

On 19 June 2019, ACER approved the Pan-European methodology for coordinating the operational security analysis (CSA methodology – Article 75 of SOGL) developed by all TSOs to define the CSA process and its high-level principles.

Besides, for each Capacity Calculation Region (CCR), TSOs supported by RSCs have developed a methodology for Regional Operational Security Coordination (ROSC) covering the regional specificities

(Article 76 SOGL) while respecting the Pan-EU methodology and existing regulation. The main points regionally determined are:

- Conditions and frequency of intraday coordination and updates to the Common Grid Model.
- Principles for Remedial Action (RA) optimisation and coordination.

In addition to the Pan-EU and regional CSA methodologies, TSOs and RSCs have developed

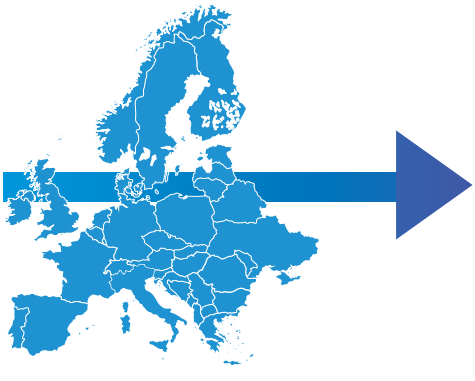
methodologies for Re-dispatching and Countertrading and Cost sharing according to the guideline on Capacity Allocation and Congestion Management (CACM).

The relatively complex legislative background and the high number of stakeholders require from Coreso an interaction at all levels. Therefore, Coreso is actively

participating in both ENTSO-E working groups and regional implementation projects. Close collaboration with its shareholders is key as well the TSO support on request to interact with national regulators or ACER. Also, the internal collaboration between Coreso business, IT and operations are of elementary importance.

PAN-EU

SOGL Article 75 Methodology for coordination operational security analysis



Regional

- SOGL Article 76 Methodology for the Regional Operational Security Coordination (ROSC)
- SOGL Article 77 Organisation of tasks between RSCs (and with TSOs)
- CACM Article 35 Coordinated redispatching and countertrading
- CACM Article 74 Redispatching and countertrading cost sharing methodology

Timeline

The timeline for implementing the CSA process in each region has been defined in the Regional Operational Security Coordination (ROSC) methodologies of each region.

In the CORE CCR, a stepwise implementation of the new service is foreseen. In June 2023, a first version with reduced scope is expected while the second version is planned to be implemented two years later, in 2025.

Also, for the Italy North area the target solution is planned for 2025. A possible first version is currently being

discussed and could be foreseen to be up and running in parallel with CORE first version. In SWE, only one and final version of the CSA service is planned which can be expected in the first semester 2024.

The Brexit results in a different legal framework for the United Kingdom which signifies that not all guidelines linked to the CSA are legally binding for British electricity system operator. Therefore, the implementation of the CSA service is on hold for all regions where the United Kingdom is involved, namely Channel and IU.

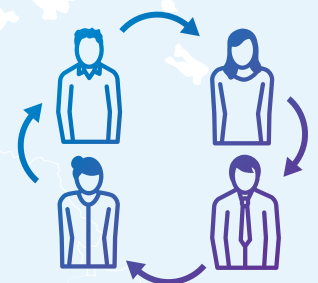
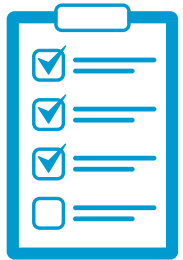
Coordinated Security Analysis Program

| | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|--------------------------|------|------|------|------|------|------|
| CORE CSA&RDCT | | | | | | |
| Improved Coordination | | ✓ | | | | |
| First Version | | | ✓ | | | |
| Second Version | | | | | | ✓ |
| ITALY NORTH CSA | | | | | | |
| Target Solution | | | | | | ✓ |
| SWE CSA RDCT | | | | | | |
| Target Solution | | | | | ✓ | |
| CHANNEL (on hold) | | | | | | |
| TBC | | | | | | ✓ |
| IU (on hold) | | | | | | |
| TBC | | | | | | ✓ |

Pan-European Dimension of CSA

In December 2020, ENTSO-E approved business requirements specifications, developed by the Project Group Inter-RSC Coordination, for two functions that will be operated by RSCs and support the CSA process: the CSA Input Data Consistency Function and Coordination Function. These requirements shall be the basis for tool development ensuring fundamental consistency between different regions.

- The **CSA Input Data Consistency Function** shall check the consistency of all the data prepared and provided by TSOs for the purposes of the CSA process - as a minimum the list of assessed elements, list of contingencies, list of available remedial actions, and list of special protection schemes. At least the following checks shall be performed by this function:
 - Schema validation of the input files ensuring that the provided input files are in the correct format.
 - Check for consistency with IGMs ensuring that the elements in the different lists are correctly represented in the IGMs.
 - Consistency with previous CSA runs/timeframes and previous services.
- The **Coordination Function** shall be the main tool for RSCs and TSOs for coordinating the remedial actions within a CCR and between CCRs. This function is used for:
 - Coordinating remedial actions between TSOs and RSCs.
 - Managing interactions between different CCRs.
 - Assessing remedial action impact to identify the TSOs that are affected by a remedial action and that, therefore, need to be included in the remedial action coordination process.



Regional Dimension

All regional methodologies are approved by the regulatory authorities and must be applied by the RSC(s) and the TSOs of the CCR. As already mentioned, due to the Brexit, the implementation is on hold in regions where the United Kingdom is involved. Concretely Coreso will be responsible for carrying out all listed tasks in following CCRs:

- **CORE** - together with TSCNET in a rotational model.
- **Italy North** - together with TSCNET in a rotational model.
- **South-West Europe (SWE)**.
- **Channel** - on hold (BREXIT).
- **Ireland and United Kingdom (IU)** - on hold (BREXIT).

The tasks in a CCR where Coreso and TSCNET are appointed together are going to be conducted mutually in a rotational principle. Not only the operation of the CSA service will be shared: both RSCs have already collaborated very closely during the design and implementation of the service.

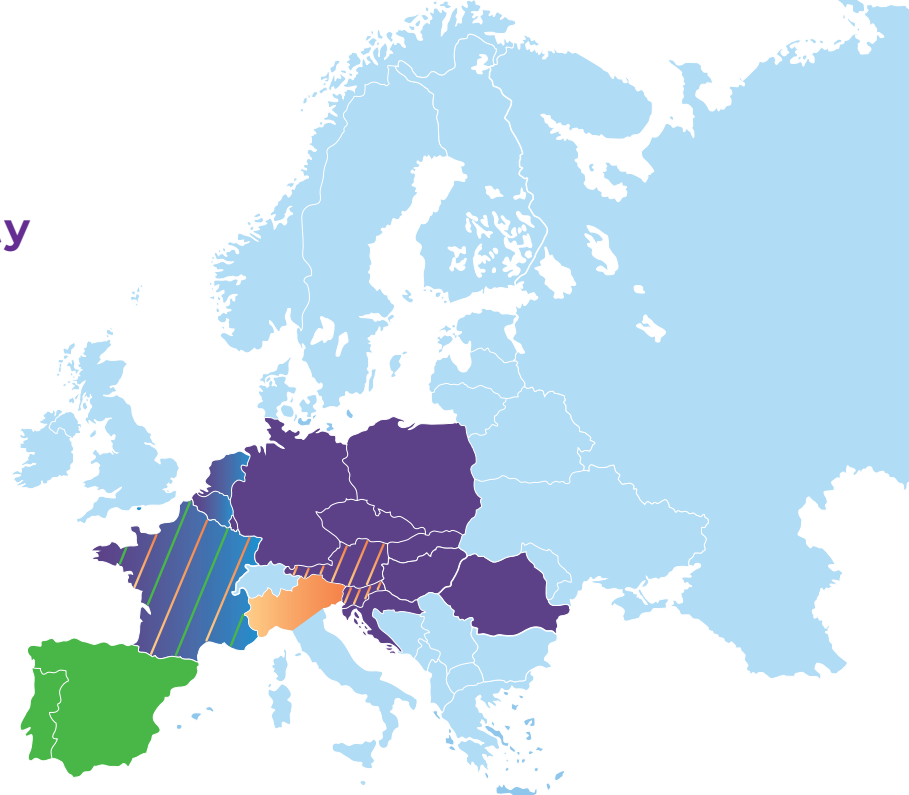
- In the **CORE CCR** a stepwise implementation is laid down in the methodology. On 4 December 2020, the Agency for Cooperation of Energy Regulators (ACER) has released the decision for this region. The first version is supposed to contain a minimum viable solution for the remedial action optimisation. What this stepwise approach means for other functions of the CSA process is going to be assessed in a fit-gap analysis. Furthermore, Coreso and its partners will define detailed requirements in 2021, and initiate procurement and development of new solutions that will underpin the delivery of the future services. Already in 2021, Coreso is going to deliver an Improved Coordination Solution (ICS) for the CORE region. Goal of the ICS is to apply improvements to the current security analysis process which build up to the target solution and ease its implementation.
- If the implementation of the CSA service in the **Italy North** region will contain a stepwise approach is currently under discussion and will be decided in 2021. Currently Coreso is actively supporting the definition of the detailed CSA process description and business requirements for the target solution.
- The methodology for the **SWE region** was approved by National Regulatory Authorities (NRAs) on 10 December 2020. In January 2021, the work was kicked off to define business requirements and business process description for SWE special requirements. Important topics such as the remedial action optimisation and security analysis specifications are still under discussion.

NGSA Process

As from September 2020, Coreso is officially providing a Security Analysis Day-Ahead (SA DA) service to National Grid ESO (NGESO - UK TSO). The SA DA project was launched in January 2019, but the planning had to be delayed due to the complexity of the CGMES migration (NGESO has one of the most complex IGMs in Europe). The CGMES files quality still need many improvements: NGESO and Coreso are working closely to stabilise the process.

NGSA is the first SA process in Coreso which uses TSOs IGMs under the CGMES format. The main objective was to set up a process reusing as much as possible from existing tools to limit the cost (Convergence, WebReport). A new tool was developed to cover the need of NGESO to reassess the ratings of their assets after any change in the grid. Besides, a dedicated afternoon desk was set up in our control room to perform the full process. NGSA was one of the first projects designed around a common Business Requirements documents between Coreso Service Development and IT departments. There will be a continuous improvement to the overall process.

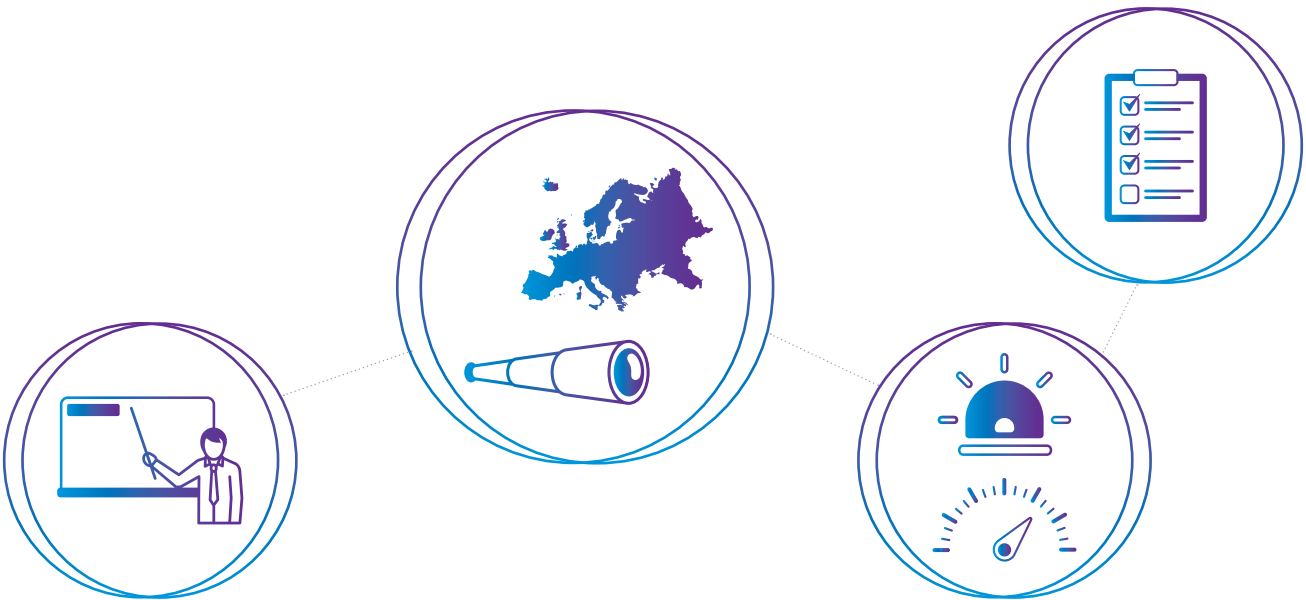
Service 3: Coordinated Capacity Calculation



CCC Introduction

Coordinated Capacity Calculation (CCC) plays an important role in the European interconnected system. Indeed, electricity exchanges are now part of daily business and flowing across Europe, crossing borders. In order to make this possible and to ensure the security of the electrical system, a preparation is needed before electricity delivery. This is the role played by Coreso as **nominated Capacity Calculation Coordinator** for three regions (CORE, SWE and Italy North) in Europe.

Indeed, Coreso calculates the cross-border capacities between countries using technical data from Transmission System Operators (TSOs). After optimisation and ensuring the security of the EU grid, Coreso provides the results (cross-border capacities) to the market energy platforms. On these power exchange platforms, market parties can trade using a secure space to exchange energy within European grid.



Service Governance

EU Regulation (namely The Third package) sets out harmonised rules for the day-ahead and intraday electricity market, in order to provide a clear legal framework for an efficient Capacity Allocation and Congestion Management (CACM). The Regulation lays down detailed guidelines including the requirements for the establishment of regional capacity calculation methodologies.

The TSOs must submit capacity calculation methodologies to regulatory authorities. Therefore, TSOs organise regional project structures (e.g. workgroups, steering body) on each CCR for, among other things, methodology drafting and implementation of capacity calculation processes, where Coreso, as RSC, provides support and expertise. Indeed, Coreso is present in regional TSO projects,

provides experts in relevant working groups and nominates representatives at the steering committee level.

When the implementation of one capacity calculation process starts, Coreso leads the tooling development within its responsibility and organises the necessary operational activities during parallel run periods, in line with its role of Capacity Calculation Coordinator.

Moreover, Coreso provides qualitative feedback about the process in parallel run, relevant results to TSOs experts and reports to dedicated regional steering committees. On an ad hoc basis, Coreso is preparing and supporting TSOs to inform external stakeholders (mainly NRAs, ACER and EU representatives) about the status and challenges of regional capacity calculation implementation.

Timeline

2021 will be the year of the implementation of one important Clean Energy Package (CEP) requirement which is the minimum capacity target known as **70% capacity criteria**, for both the Italy North and SWE CCRs. The capacity monitoring defined by CEP will be an useful indicator for TSOs to measure the compliancy of cross-zonal capacity towards a target defined by ACER.

CORE and SWE areas will each benefit from a new intraday capacity calculation process implemented for the IntraDay (ID) timeframe. As a result, new coordinated services will be performed for those two regions, in addition to the Day-Ahead (DA) processes already developed.

A first RSC service for long-term capacities (yearly and monthly capacities) for the Italian North-border region should be delivered in 2021. As Capacity Calculation Coordinator, Coreso has indeed to complete the span of all capacity products offered to the market.

In Italy North area, RSCs are working together with TSOs to finalise the implementation of the necessary requirements for the DA and ID capacity calculation methodologies before the end of Q1 2022.

Coreso will also support TSOs in all capacity calculations topics and activities in the different regions by giving advice, sharing information, or taking the lead in external working groups.

The Coordinated Capacity Calculators Nomination Within the Italy North Region

On 31 January 2020, the TSOs from the Italy North region appointed **Coreso and TSCNET as the Coordinated Capacity Calculators** for the day-ahead and intraday Capacity Calculation of the Italy North CCR. The two companies will also take on the tasks of the Coordinated Capacity Calculator for long-term capacities for this region.

Capacity Calculation Long-Term

CORE CCR

As a TSOs agreement on the Capacity Calculation Long-Term (CC LT) methodology for the CORE CCR could not be found by August 2019, exchanges between ACER and European Commission occurred until November 2020 to find an acceptable way forward for all parties.

As a result of this collaboration, Coreso was appointed on February 2020 as **Convener** for the Regional Project Team involving TSOs and RSCs from the CORE CCR.

This team successfully drafted a CC LT methodology which was submitted at the end of November 2020. Being Convener, Coreso actively participated in this methodology elaboration and gave technical support to TSOs. The submitted methodology considers Flow Based Explicit (FBE) allocations (currently allocations are Net Transfer Capacity Based), which will imply the allocation processes for all parties (Single Allocation Platform, Market Parties and TSOs).

The regulatory deadline to implement the CC LT CORE process is 5 years after approval - so mid-2026 in this case - but such an implementation timeline might still be challenged by CORE NRAs and ACER.



Italy North CCR

Coreso participated proactively in the draft and approval process of the CC LT methodology for Italy North which has been approved by NRAs on 15 December 2020, providing technical support and performing experimentation results to prove the efficiency of the proposed methodology. Italy North TSOs and Coordinated Capacity Calculators have 12 months to develop and implement this methodology, with Coreso as a leader.

To stay proactive on this task, a detailed "Design Document" was drafted by Coreso in order to send, by the end of January 2021, requests for proposals to select an IT vendor.

So far, a capacity calculation based on a statistical approach is unique and does not require any Network Operation expertise from the operators as this new process aims to be as much automatic as possible.

Besides, as CC LT is a new service to be provided by RSCs, TSOs will have to adapt their internal processes to be able to provide inputs on an industrial way, which is a prerequisite to allow a full automatization of the process. The go live of CC LT service is planned on November 2021 given that it must happen before the launch of 2022 Yearly Auctions planned at the end of 2021. If the November 2021 window is missed, the go live will be postponed by one year.

Capacity Calculation Day-Ahead CORE

In February 2019, Capacity Calculation Day-Ahead (DA) CORE methodology was approved by ACER, starting a new round of revision of the capacity calculation implementation by TSOs together with Coreso and TSCNET. Overall implementation planning and activities were updated setting new milestones for parallel run operation in 2020.

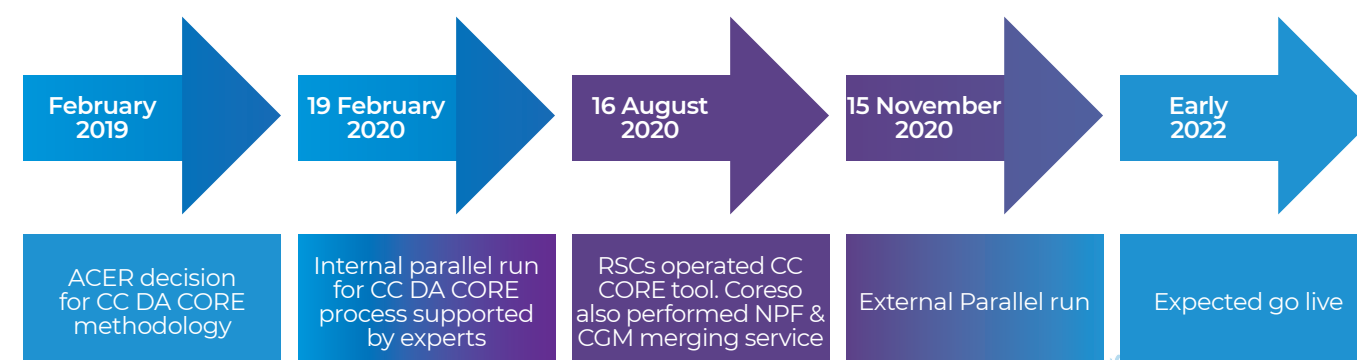
In a first phase, the development of industrial tools was continued by CORE TSOs and RSCs which made the (re)launch of the Internal Parallel run possible on **19 February 2020**, where experts from all companies performed the Capacity Calculation DA CORE process with the different developed tooling. From March until June, different improvements were achieved in the internal parallel run, leading to enhancement of both tooling and quality of results.

After reaching sufficient maturity of the full CORE capacity calculation chain, Coreso operators joined

the project on **16 August 2020**, supporting the CORE region by operating the Capacity Calculation CORE tool, together with our colleagues from TSCNET. In addition, Coreso operators now perform the Net Position Forecasting (NPF) and Common Grid Model (CGM) merging service. Step by step the computed business days were increased in parallel run operation from 3 to 7 business days in October.

On **15 November 2020**, CORE TSOs entered the next phase of the DA CORE project, with a progressive start of the External Parallel run, meaning that Capacity Calculation results deemed representative have been made publicly available. In the first months of 2021, this should grow to a stable publication of 7 business days a week.

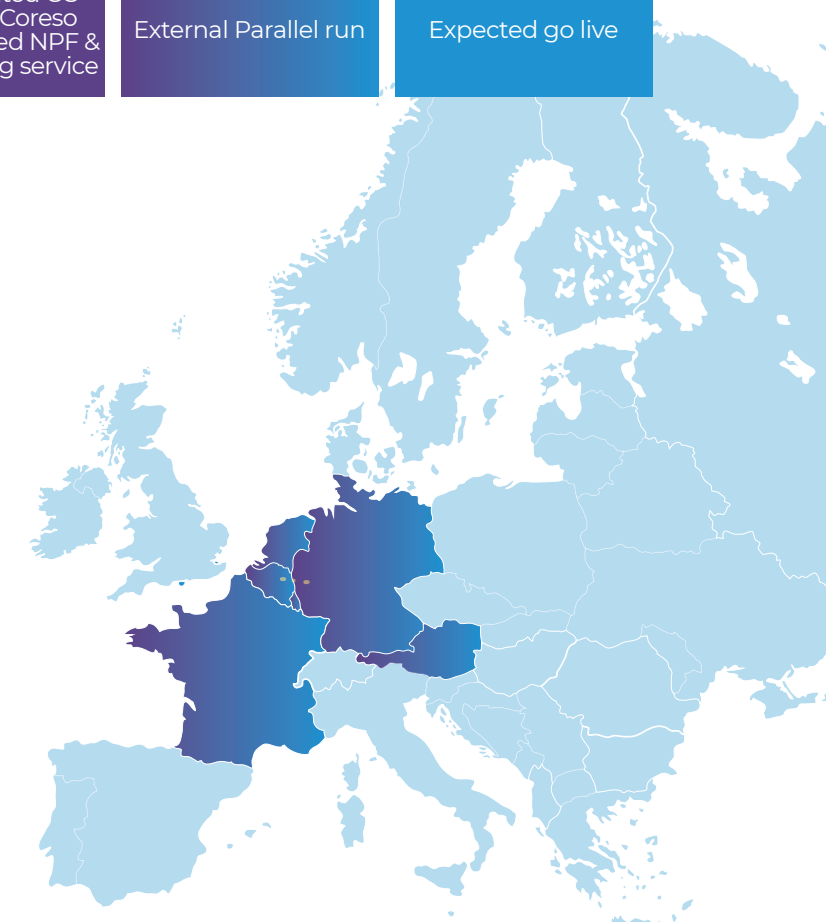
Following the decision of the European Commission (DG ENER), the go live of CC DA CORE is now set to early 2022.



Central Western Europe ALEGrO

The introduction of the ALEGrO DC interconnector ("Aachen Liège Electricity Grid Overlay"), which creates a new electrical border between Germany and Belgium, has had a big impact on the CC Central Western Europe (CWE) processes and all the services Coreso provides for the CWE TSOs, including Flow-Based Common System Operator, Merging Entity and Net Position Forecaster.

One of the reasons why the ALEGrO cable had a big impact on the Flow-Based DA CWE Capacity Calculation & Market Coupling processes is that it is considered through the 'Evolved Flow-Based' methodology. Simply put, this means that the DA electricity market is fully able to determine the exchange between Germany and Belgium, and to also use this exchange to optimise market exchanges throughout the rest of the European electricity market.



Net Position Forecast

In 2017, together with TSCNET, Coreso started to provide a day-ahead (DA) Net Position Forecasting service for the CWE CCR. This forecast is used by CWE operators to coordinate remedial actions, to facilitate flows in the expected DA market direction. Using the best machine learning methods available at that time, the forecasting tooling trained itself, using the historical DA market exchanges of the previous years as training data.

The world of machine learning is, however, a fast paced one, which lead to the decision beginning of 2020 to develop a new Net Position (NP) forecasting tool from scratch, to be able to consider the latest evaluations and techniques. Furthermore, the available training dataset was extended with new data sources such as renewable energy (wind, solar hydro, etc.), load, availability of generation, and price forecasts.

After a thorough vendor selection process, in which Coreso was able to speak to many interesting parties, tooling developments started at the beginning of Q2 2020. Despite the impact of the coronavirus health crisis, developments still went according to schedule, which allowed Coreso to start providing the NP forecasting service to CORE TSOs in the Flow-Based CC DA CORE internal parallel run in June 2020.

In the CWE region, the new NP tool was introduced together with the go live of the ALEGrO cable, for which exchange is now also forecasted. This has led to significant forecasting accuracy improvements.

Monitoring of 70% Requirements (minimum electricity exchange volume)

The Clean Energy Package (EU regulation) has set a binding minimum 70% target for electricity interconnector capacity for cross-zonal trading. The regulation sets the rule as the Minimum capacity margin Available for Cross-Zonal Trade (also referred to 'MACZT' indicator in technical reports) to be met by all TSOs on all critical network elements. The 70% target is legally binding since the start of 2020 and monitored by ACER.

In order to properly monitor the capacity value output of the Capacity Calculation day-ahead in SWE process, TSOs from SWE defined a coordinated way to compute the relevant indicators (MACZT) defined in the ACER methodological paper. Coreso participated in the design of the technical solution and started its implementation with a delivery in early 2021.

Service 4: Short Term Adequacy

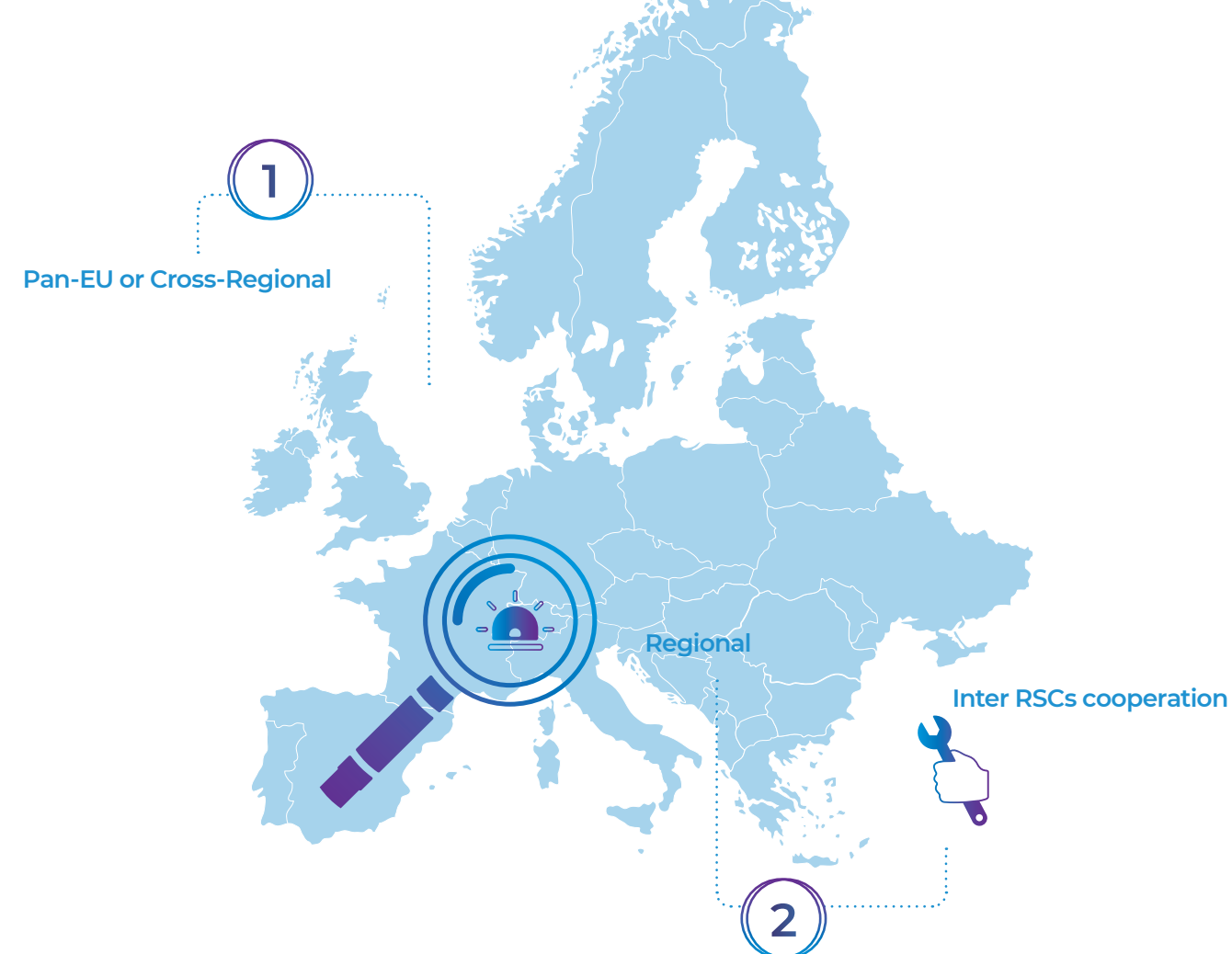
STA Introduction

Based on hourly forecasts for the upcoming week (D-1 until D-7), Regional Security Coordinators (RSCs) perform regional adequacy assessments to detect situations where a lack of electricity adequacy is expected in any of the control areas or at regional level, considering possible cross-border exchanges and operational security limits.

To enable RSC to achieve such evaluations, each Transmission System Operator (TSO) shall provide the RSCs with the necessary information (expected total load, availability of power generation modules and operational security limits) for its control area. This data

is collected in the STA Industrial Tool (also called Pan-European or Cross-Regional tool).

Following this, a regional assessment can be performed when triggered by the results of STA Cross-Regional assessment or on TSO request. For instance, in case there is a lack of adequacy assessed or estimation from TSOs, RSC will perform a regional adequacy assessment in the relevant adequacy region. It will then deliver its results together with the actions it proposes to the associated TSOs to reduce risk.



STA Cross-Regional & Pan-European Go Live

As already mentioned in the “Highlights” section, STA Pan-European tool went live on 4 May 2020.

This Cross-Regional Adequacy Assessment Tool (STA Tool) allows for the realisation of the coordinated adequacy assessment process for the week-ahead timeframe.

It also combines the functionalities of input data gathering and quality checks, deterministic and probabilistic calculations, report and visualisation/ shared centre.

Timeline

Cross-Regional STA

Work on version 2 of STA Industrial tool kicked off in 2020. Necessary improvements concern DC tripping and Generator tripping, as implemented in the ACER Decision of **6 March 2020** on the methodology for short term and seasonal adequacy assessments. This development contributes to compliance with the EU Risk-Preparedness Regulation, under the Clean Energy Package. The deadline set for implementation of Version 2 is **March 2021**. Generation tripping reflects the uncertainties on generation availabilities. This is one of the new hypotheses to be taken into consideration to play STA probabilistic scenarios, along with the tripping of HVDC lines.

Regional STA

Regional STA is divided in two phases, 1A and 1B, with the reason for this division being solely availability of appropriate CGMES IGMs required for the analysis. Phase 1A had its soft launch in **October 2020** and is expected to be in full swing in first half of 2021 with having all TSOs and RSCs on board. Phase 1B is expected to roll out in **2022-2023** depending on CGMES IGM readiness.

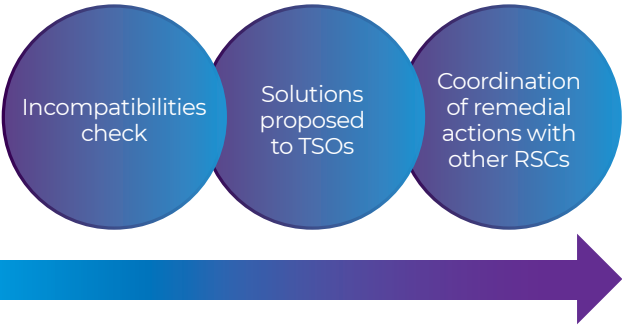
The STA and OPC Pan-European IT tools have been developed by the consortium consisted of Unicorn and RTE International, based on a Development Agreement for OPC and STA Pan-European tools Implementation – detailed design phase contract dated 20 November 2018, under the governance of ENTSO-E System Operations Committee (SOC), ENTSO-E RSC Project Steering Group and steered by ENTSO-E Secretariat Digital section.

The project was supported by the contribution of the STA and OPC Project Groups and Task Forces regrouping TSO experts, convened by Coreso for

Service 5:
Outage Planning
Coordination

OPC Introduction

As one of the RSC mandatory services to be provided to European TSOs, the main role of Outage Planning Coordination (OPC) process is to determinate Tie-Lines Inconsistencies (TLI) at a Pan-European level but also Outage Planning Incompatibilities (OPI) per region. The RSC proposes then solutions to TSOs to solve them and finally coordinates Remedial Actions with other RSCs.



Coreso performs the OPC process on a weekly but also yearly basis. The process encompasses 4 major steps, called “Merged steps”, running OPC Merged Functions which combines the functionalities of input data delivery, their validation and implementation in the OPC availability database (the merge process) as well as the ability to export this information upon request.

Additionally, a monthly process is performed only for the first step to determinate possible Tie-Lines Inconsistencies between TSOs.

STA. The IT single point of contacts from all TSOs were also appointed to support the integration and interoperability of the tools with local TSO IT solutions. The TSOs and RSCs colleagues also participate in detailed design workshops and user acceptance tests. In 2020, the RSC services Multilateral Agreement signed by the ENTSO-E SOC provides the contractual arrangements for the Pan-European tools and processes, and covers the operational Coreso cost. The drafting and approval of such a document was an achievement towards a more structured approach in terms of contract and budget management.

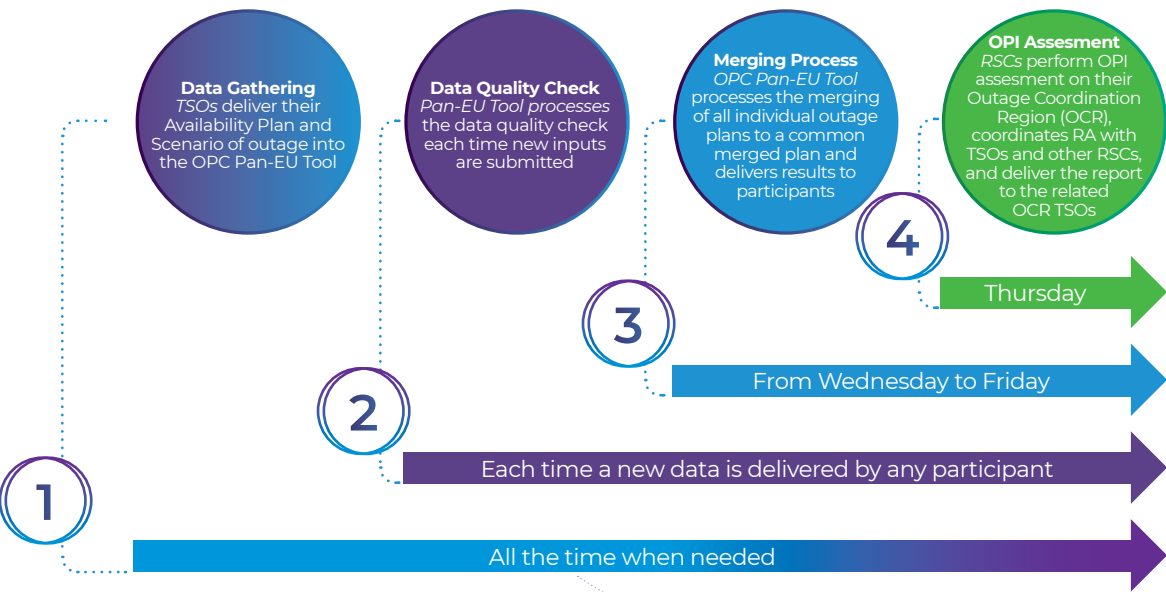
Each ENTSO-E TSO involved in the process delivers its own Outage Planning data input to the OPC Pan-European Tool (same concept and IT development apply as for STA Pan-European Tool described previously).

During OPI process, RSCs determine whether the outage planning of TSOs is secure. In case incompatibilities between relevant assets (grid elements, generators or loads) are detected, RSCs shall propose Remedial Actions (RAs) and perform a security assessment whether the grid is secure after the RAs have been applied.

The whole OPC process is done thanks to close coordination with concerned TSOs and/or impacted RSCs.

The governance and structure of the project have been described in the STA section as both STA and OPC are managed the same way.

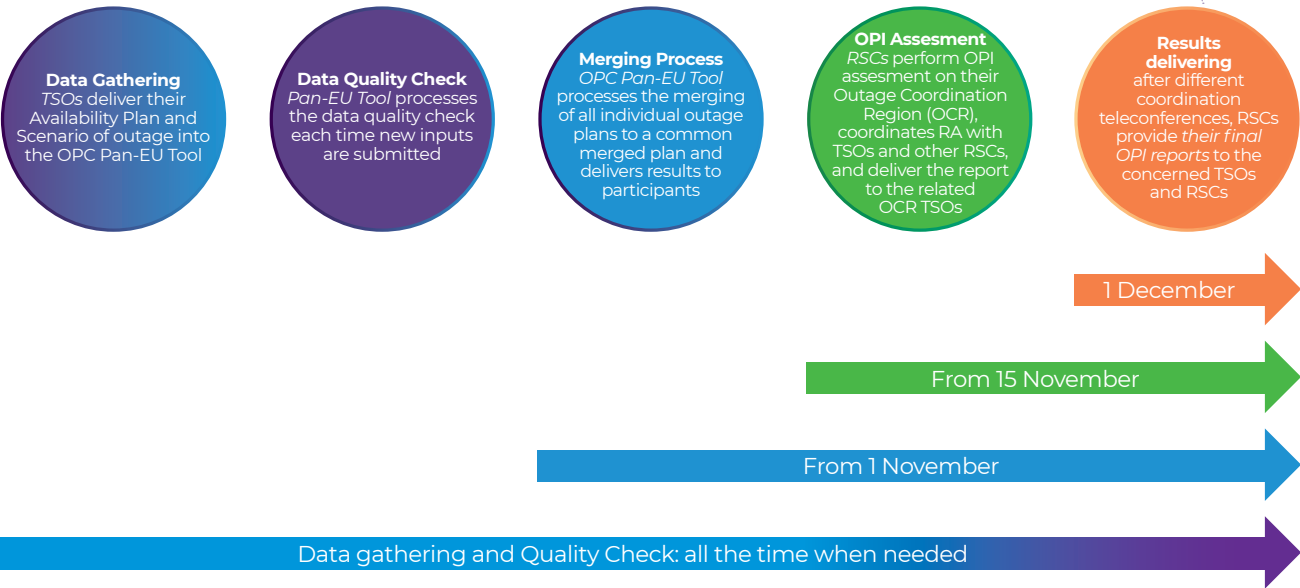
OPC Operational Weekly Process: 3 reports/week



DID YOU KNOW?

Coreso performs analysis to detect Outage Planning Incompatibilities (OPI) for the SWE and CORE regions.

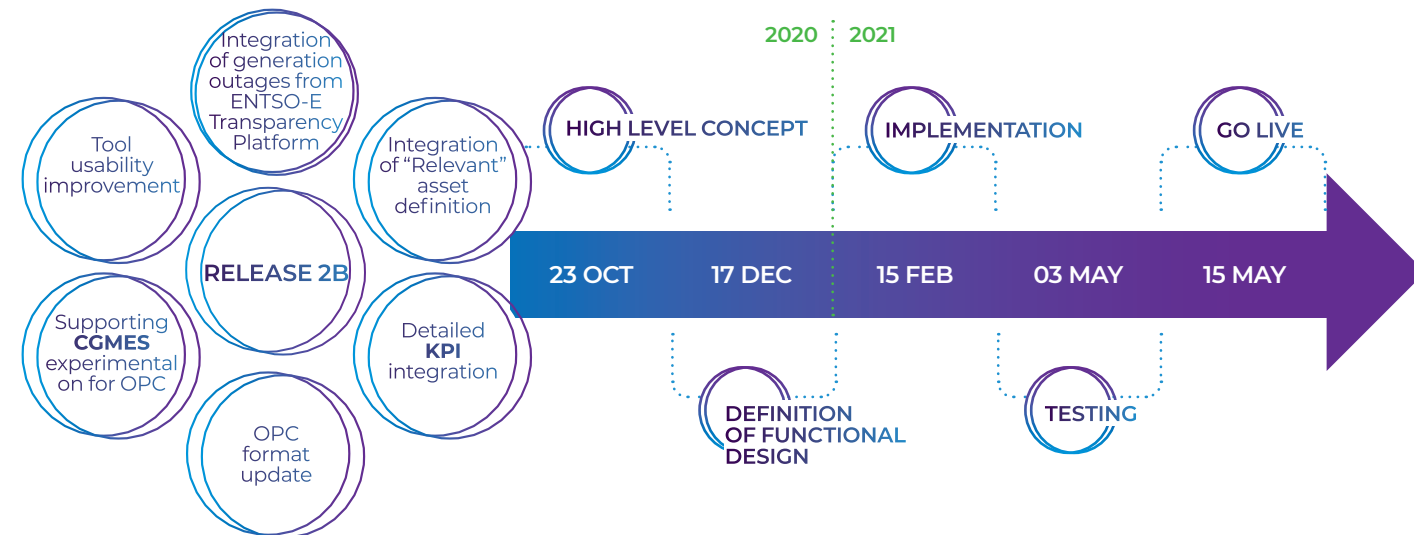
OPC Operational Yearly Process



Timeline

The release of the OPC Pan-EU tool (version 2b) is foreseen for mid-May 2021; the key milestones for 2020 and 2021 are presented on the timeline below.

2021 Milestone for OPC Pan-EU Tool



OPC Cross-Regional Pan-European Go Live

The version 1 of OPC Pan-European Industrial tool was fully operational by 31 March 2020. As shown on the above 2021 timeline, a new release of OPC Pan-EU tool is expected by mid-May 2021. This latest version allows for relevant points supporting CGMES experimentation for OPC, integration of generation outages directly from ENTSO-E transparency platform instead of being delivered by TSOs.

OPC Year-Ahead Process

2020 was the third year of processing the year-ahead Outage Planning Incompatibilities assessment. However, it was this year that the RSCs referent of OPC process worked closely with the Network Models & Forecast Tools (NM&FT) group in charge of Common Grid Model (CGM) year-ahead construction. The goal of this successful collaboration was to build a set of CGM by including OPC referents for reviewing them according to the need of OPC process.

Service +: Critical Grid Situation

CGS Introduction

Events (such as unexpected frequency drop or extreme weather conditions) can impact the interconnected power system at any time, leading to a Critical Grid Situation (CGS). Alignment and close collaboration between TSOs are then necessary to maintain operational safety and supply security, as these events could have consequences on control areas of multiple TSOs.

The CGS process can be triggered by TSOs or RSCs in the operation planning phase or during the procedure for handling forced outages between Day-7 and Hour-1 (till 'close to real time').

At that moment, RSCs support TSOs by playing an important coordination role. They propagate information to all TSOs, conduct studies and propose mitigation measures such as the review of cross-border capacities or load flow re-dispatching.

Besides, enhancing their cooperation, Coreso and TSCNET agreed to align their training support and to propose common live sessions to test the CGS communication process.

A Critical Grid Situation is a potential emergency state identified in the operational planning phase, linked to an adequacy or security analysis issue.

During this tense situation, the available regular countermeasures are exhausted, and regionally coordinated extraordinary countermeasures must therefore be taken by TSOs to secure the grid.

“Next to the ENTSO-E CGS communication process, a proposal for a methodology to activate coordinated measures to solve a CGS has been developed by the TSOs of the CORE region of TSCNET.”

In December 2020, a CCR CORE webinar was organised for NRAs, TSOs, and both Coreso and TSCNET, where the CGS legal interpretation, cost sharing and high-level process related to this proposal were presented and discussed. A follow-up webinar is foreseen for 2021 addressing the details for a CGS cooperation between both RSCs and TSOs, and the technical implementation. The next step could be that TSOs and RSCs together create a suite of applicable measures tuned to the needs of each region to solve a CGS.”

DANNY KLAAR - ADVISOR AT TENNET TSO



OUR KEY SUPPORT PILLARS

IT Activities

The terms “IT” and “information technology” are widely used in business and the field of computing. The terms are generically used when referring to various kinds of computer-related work, which sometimes confuses their meaning. There are few business activities that can run without IT nowadays.

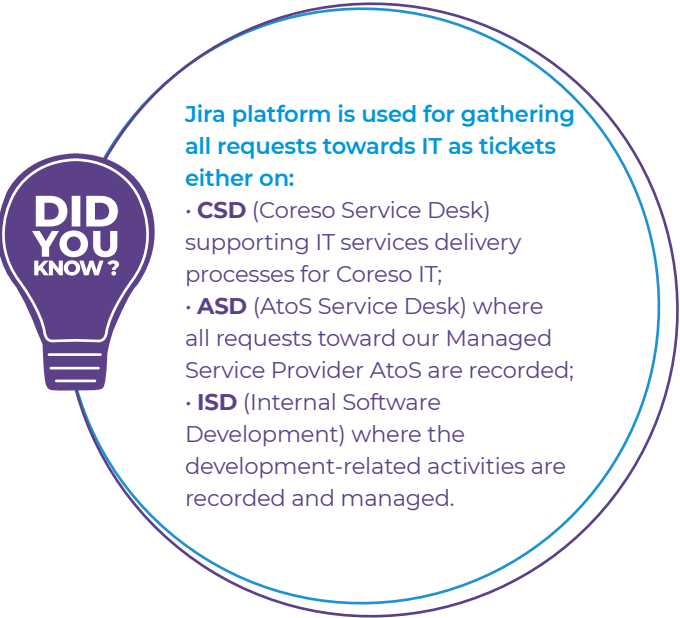
Nevertheless, “IT” means running a business too. The activities are ranging from conceiving a service and its delivery model to sustain the best value for the company, to small technical details as to fix small issues in a macro.

There is a lot happening “underground” or behind the scenes to ensure that each employee or stakeholder is able to work in this technical environment.

IT is there to ensure the optimal alignment of technologies to support the business at optimal cost/revenue level.

If you are looking to an analogy, IT challenges are sometimes similar to replacing an engine on a flight between Brussels and New York while ensuring the passengers do not notice it.

Some statistics from our Jira platform are gathered hereunder for 2020.



CSD

| Type | Critical | High | Low | Medium | Grand Total |
|-----------------|----------|------|-----|--------|-------------|
| Change | | 5 | 8 | 3 | 16 |
| Incident | 71 | 35 | 290 | 99 | 495 |
| Problem | 1 | | | 1 | 2 |
| Service Request | 1 | 10 | 418 | 13 | 447 |
| | | | | | 960 |

ASD

| | | | | | |
|-----------------|---|----|----|----|-----|
| Change | | 7 | 49 | 34 | 90 |
| Incident | 6 | 36 | 62 | 46 | 150 |
| Problem | | 2 | 4 | 1 | 7 |
| Service Request | 1 | 1 | 41 | 25 | 68 |
| Task | | | 3 | | 3 |
| | | | | | 318 |

ISD

| | | | | | |
|----------|----|----|-----|----|-----|
| Bug | 11 | 31 | 58 | 31 | 131 |
| Epic | | 2 | 54 | 6 | 62 |
| Story | 2 | 17 | 77 | 20 | 116 |
| Sub-task | | 1 | 101 | | 102 |
| Task | | 26 | 271 | 58 | 355 |
| | | | | | 766 |

Main Challenges for Coreso

The upcoming year will be the initiation of “transformation” of the IT operating model to adapt to the new technologies while structurally supporting the legacy environment. This transition to a more structured and efficient organisation will impact the company at a transversal level requiring a lot of attention at managing the change properly.

The energy sector ecosystem is evolving quickly: we are required to increase our collaboration capabilities while improving the security efficiency. This means a more open, flexible and agile platform implementation supporting our needs for standardisation, industrialisation, automation.

Finally, a better governance will be required to support all these elements in a transparent manner.

Milestones in 2021

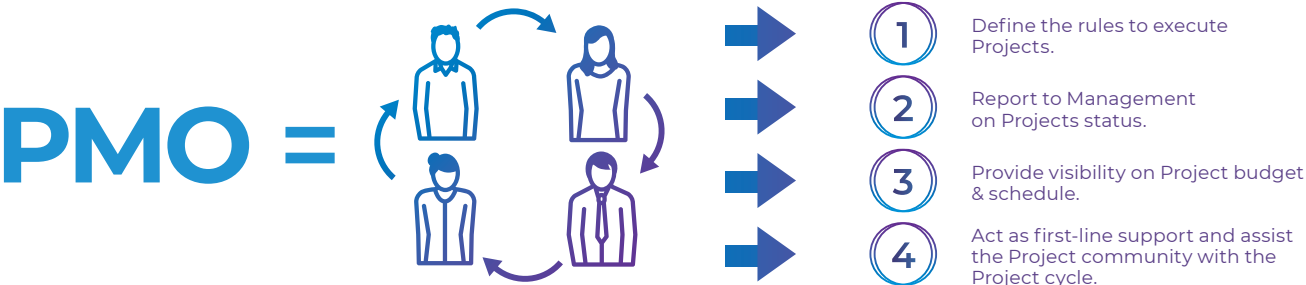
- Development and definition of the IT strategy.
- EU tendering to select a new IT Managed Service Provider able to operate the current model while accompanying us in a structuring course to IT operational excellence in a secured model.
- Streamlining of the ITSM (IT Service Management) required process across the company as Incident, Service Requests and Change Management.
- Implementation of the “new platform” that will support us for the future and cover our technology, people, processes and budget needs.
- Fundamental network redesign to accommodate the transformation and future projects.
- Definition, Design, Development and Deployment of the required systems environment to sustain the new processes.
- Implementation of a functional SDLC (Software Development Lifecycle) that fits our needs and can embark our third parties development partners transparently.

PMO Methodology Between the Past and the Future

“Coreso is growing and its project methodology as old-fashioned methodology is now outdated. As we must keep up with the changes happening in the world and around us, Coreso is developing a new project technology which leads to many IT developments. Today we work in a waterfall, and we will be moving towards a hybrid model to take into consideration the IT agile methodology. This is an important

but necessary challenge as it will enable our IT team to deliver the regulated services faster and with less development cost. In addition to that, maintaining a single version of truth will help us to reduce the time we are spending on administrative tasks.”

ALAA HAGE - PROJECT MANAGEMENT OFFICER



In 2020, a waterfall-based methodology has been initiated and applied. It all starts with the identification of a new idea: important and relevant information should be provided in order to move forward. Ideas can be submitted by anyone within Coreso and they can refer to company collective objectives, TSO additional needs or even budgeted investment for our daily run.

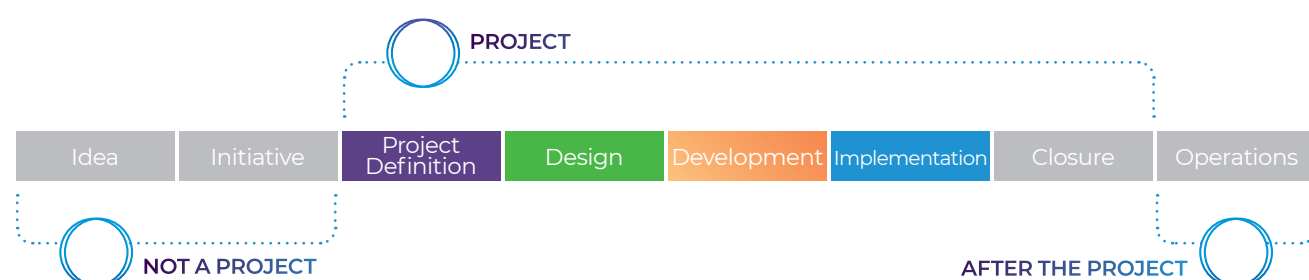
Any **Idea** should be then reviewed by the appropriate management member to prioritise it.

During the first **Initiation** phase, a business case should be elaborated to define the high-level business requirement(s). The idea then becomes an official project. Following the assignment of the Project Manager, a planning phase to define the **Project** schedule & budget will be done before the official **Design** and **Development** of the requirements.

After the go live, an end-to-end testing with the lead end user will take place during the **Implementation** phase.

Last, the **Closure** of the project will be applied in line with the official hand over to the **Operations** Department.

Keeping a track on all the tracks within the Portfolio is essential to enable Coreso management to prioritise and assign the resources on the right project and activities.



Communication

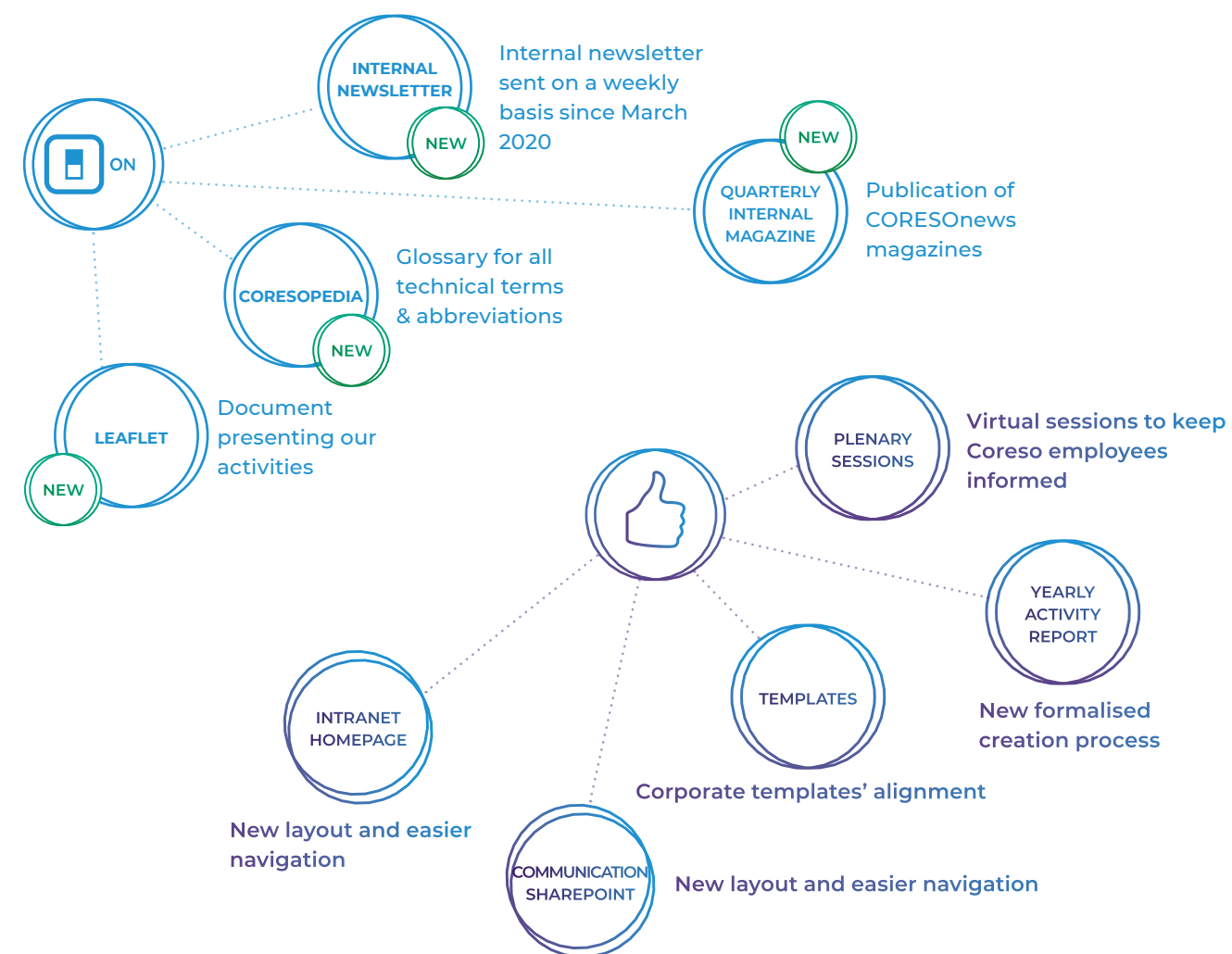
At the beginning of 2020, Coreso welcomed a Communication Officer in order to improve internal and external communication. Several tools were created and different initiatives were launched to reach three key objectives in particular:

- Develop awareness and understanding about Coreso activities.
- Improve knowledge management and learning at Coreso.
- Contribute to ensure a smooth growth transformation process of our company.

Telework being the new norm, the sanitary situation challenged our organisation: we must find new or other ways of communicating (for instance organising more regular online plenary sessions) to keep our employees informed of our different departments' achievements and projects evolution, but also Coreso objectives and transformation process. Some initiatives were then accelerated to achieve this objective.

Coreso aiming for operational excellence, some communication tools and processes were also standardised or formalised to ensure a consistent and efficient way of sharing information, as well internally and as externally.

In 2021, we will pursue our activities in this direction, while focusing on improving communication towards our shareholders and European electricity sector community.



CORNET

CorNet

CorNet is the **cooperation Programme between Coreso and TSCNET** for the common design, development and implementation of the five RSC services, in compliance with the agreed allocation of tasks between the two RSCs. The programme seeks to find synergies, cost optimisation and know-how sharing in order to implement the EU network codes in a timely, cost-efficient and effective manner while providing a high-quality service for Coreso and TSCNET shareholders.

As a result, Coreso and TSCNET are creating common plans to deliver processes and tools to provide services either on a rotational basis or based on the agreed task split commonly to customers.

The RSC Cooperation Programme started in Q1 2020, driven by the decision of Coreso and TSCNET shareholders represented in the Zurich Group. This Programme was then renamed CorNet after a democratic process that involved all employees of the two RSCs, in September 2020.

“The CorNet Programme is an essential catalyst for the sustainable harmonisation of processes and tools among future RCCs across the regions.”

As such, it is an important building block contributing to the ambitious target making the electricity grids fit for the energy transition by providing cost effective and advanced solutions.”

MARTIN GODEMANN, BUSINESS ARCHITECT

“Our goal is to successfully implement the European codes, following the principle of “right first time”.

But as the complexity of the program increases, we need to structure our approach, otherwise we will exhaust ourselves inefficiently.”

JEAN-FRANÇOIS GAHUNGU, CHIEF EXECUTIVE OFFICER (CEO)



“We should focus on a clear plan and concrete deliverables in each phase of the project.

Deliverables that we can validate in all relevant bodies, that shows our stakeholders the progress that we realize. This is the best way forward to win the trust of the TSOs.”

JAN VAN ROOST, CHIEF OPERATIONS OFFICER (COO)

Main Achievements

During the first half of 2020, the RSC Cooperation Programme defined a high-level working structure and identified the key challenges and deliverables for the cooperation between Coreso and TSCNET. Over the year, more concrete steps have been taken:

- A common Programme structure, including a Programme Management methodology and PMO organisation, has been defined and established.
- The Programme governance between TSCNET and Coreso has been formulated. Within a mutually agreed upon operational model, specific roles and responsibilities have been defined to ensure the right people are at the right place (especially within the service and function projects) to deliver high quality services to the TSOs in an efficient manner.
- A common SharePoint structure has been set up.
- All projects have been resourced with project managers and service engineers from both RSCs.
- The first versions of Project Initiation Documents (PIDs) have been created, containing basic information on all projects within the cooperation Programme to create a mutual understanding of what we want to achieve in the various projects.
- The CorNet Expert Groups have been organised, namely the Service Architecture Group (responsible for the business and IT alignment on CorNet’s Target Operating Model, documentation and quality standards) and the CSA Experts Group (acting as a “consulting” group for the CorNet Programme).
- Information sessions were organised for all Programme members, aiming to share information and best practices between Coreso and TSCNET. A “Town Hall session” was also organised to answer questions and facilitate a dialogue between Coreso and TSCNET Management, Programme Management and employees.

Timeline: Next Steps and Future Challenges

In 2020, the foundations of CorNet were set up with a focus on organisation, governance, resourcing and first iterations in stakeholder management.

In 2021, CorNet will, together with the Capacity Calculation Regions CORE and Italy North, further define business processes and design in detail a target operating model.

The future brings challenges to the Programme. There are many dependencies on the regulatory framework that may have a strong impact on the definition of business processes and technology solutions.

Transparency and trust between Coreso, TSCNET and shareholder TSOs is of utmost importance and regular communication and engagement will be key.

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1. THE COMPANY

Coordination of Electricity System Operators (Coreso) founded in 2008, encompasses nine European transmission system operators which are also its shareholders. When Coreso launched its operations in February 2009, it was one of the first technical coordination centres in continental Europe to be shared by multiple electricity Transmission System Operators (TSOs).

Coreso provides services to secure energy transmission for over 55% of the population of the European Union. Located in Brussels, about eighty engineers combine their expertise 24 hours a day, 7 days a week to anticipate the operations both in the short term and the long term.

2. COMPOSITION OF MANAGEMENT BODIES

2.1. Board of Directors

On 31 December 2020, the Board of Directors had the following members:

- **Mr Enrico Maria Carlini**, Chairman of the Board of Directors (as of 25 October 2020);
- **Mr Fintan Slye**, director and Vice-Chairman of the Board of Directors;
- **Mr Dirk Biermann**, director;
- **RTE Réseau de Transport d'électricité SA**, with **Mr Sébastien Henry** as its permanent representative, director;
- **Mr Olivier Arrivé**, director;
- **Mr Mauro Caprabanca**, director, (as of 25 October 2020);
- **Mr Patrick De Leener**, director;
- **Ms Maria José Clara**, director;
- **Ms Pascale Fonck**, director;
- **Mr Tomás Domínguez Autrán**, director;
- **Mr Emilio Cerezo Diez**, director;
- **Ms Quinn Roisy**, director;
- **Mr Rodney Doyle**, director

None of the directorships are remunerated and all will expire immediately after the 2021 Ordinary General Meeting that will be asked to approve the annual accounts as of 31 December 2020.

The Board of Directors met five times in 2020 (on 31 January, 2 April, 19 June, 23 October, and 11 December 2020) and discussed technical, financial, economic and strategic issues.

2.2. Daily Management Responsibilities

Mr Jean-François Gahungu was appointed Chief Executive Officer, effective from 1 November 2016.

Mr Jan Van Roost was appointed Chief Operating Officer, effective from 1st of August 2017.

2.3. Auditors

The Ordinary General Meeting of 19 April 2018 appointed KPMG *Réviseurs d'Entreprises* SCCRL and Ernst & Young *Réviseurs d'Entreprises* SCCRL as the company's auditors for a term of three years, expiring at the Ordinary General Meeting to approve the annual accounts for the end of the year, 31 December 2020. KPMG *Réviseurs d'Entreprises* SCCRL is represented by Alexis Palm and Ernst & Young *Réviseurs d'Entreprises* is represented by Patrick Rottiers.

The auditors' remuneration is €13,430.00 per year, to be indexed annually in line with the consumer price index.

3. MAIN EVENTS DURING THE YEAR

3.1. Context

Coreso's mission is to proactively support TSOs to ensure security of electricity supply on a European regional basis. Coreso focuses its coordination activities and thus provides the highest added value from a year-ahead until intraday (few hours before real time). Coreso, as the other RSCs (Regional Security Coordinators), is a service provider of nationally regulated TSOs. Coreso services are driven by European regulations (3rd and 4th energy packages). According to these regulations, Coreso is currently implementing regulated services described below:

- Improved Individual Grid Model/Common Grid Model
- Coordinated Security Analysis
- Coordinated Capacity Calculation
- Short Term Adequacy
- Outage Planning Coordination
- Emergency and Restoration
- Risk Preparedness

Accordingly, Coreso collaborates with the TSOs and other RSCs to:

- provide the control centres with forecasts about the security of systems, perform operational planning activities, carry out security analyses which simulate numerous scenarios,
- propose remedial actions and coordinates exchanges between national control centres, which remain responsible for implementing these actions in their respective systems.

The development of renewable energies, which are by nature intermittent, and the increase in cross-border exchanges within the European electricity market make electricity flows increasingly variable. In this area, Coreso has demonstrated and continues to demonstrate daily a significant level of reliability and expertise.

Its added value in terms of proactive identification of situations likely to present a risk to the electrical system is now essential. Indeed, risks can only be detected by building an overview beyond the national framework of each individual transmission network.

3.2. Operational Services: the Five Mandatory Services

3.2.1. Improved Individual Grid Models (IGM) & Common Grid Models (CGM) delivery

The CGM service delivery consists in an iterative process with two core tasks: creation and collection of IGMs provided by the TSO, the merging of those IGM into a Pan-European CGM by Coreso. All the data exchange is supported by the Operational Planning Data Environment (OPDE). Eventually the shared CGM are the basis for RSC services implementation or operations. This service applies to all timeframes on a Pan-European level.

Since September 2020, the 'Basic CGM capability' milestone has been achieved. This implies that the OPDE platform can be used for the exchange of IGM and CGM by the TSO and RSC community. In 2020, Coreso has trained its operators to deliver the service in target hours. The launch of the CGM service is planned for the end of 2021, involving all European TSOs and RSCs.

3.2.2. Coordinated Security Analysis

The Coordinated Security Analysis Service aims to identify and coordinate solutions (Remedial Actions) for network constraints at a regional level. Current Security Analysis Service includes a daily analysis of the 24 day-ahead timestamps and two analyses in intraday timescales, coordinating with TSOs and RSCs focusing on Coreso shareholders.

In 2020, the three key methodologies for the future Coordinated Security Analysis Service have been adopted in the CCRs (Capacity Calculation Regions) where Coreso provides its services. Coreso played a key role in contributing to TSOs regarding the methodology drafting and aligning the regional methodologies to enable a smooth implementation and mitigate operational risks. Also, Coreso has launched the service for NGESO for the first time. The implementation of the CSA service in Coreso will be strongly connected with the CorNet Programme with the TSCNET partners, where common solutions will be designed and developed.

3.2.3. Coordinated Capacity Calculation

This service aims to:

- Apply approved regional coordinated methodologies to compute parameters defining available cross-zonal capacity (either Net Transfer Capacity (NTC) or Flow Based (FB) parameters), based on CGM and input data from TSOs. The previously mentioned methodologies aim to optimise cross-zonal capacities while ensuring coordinated security.
- Include improvement proposals to increase computation quality (such as coordination of net positions of each IGM, if it is part of the regional methodology) and/or to optimise available capacity by using non-costly Remedial Actions if it is part of the regional methodology).

RSCs are officially nominated as Capacity Calculation Coordinator by TSOs of each Capacity Calculation Region (CCR: CORE, Italy North, Southern Western Europe) to perform these activities.

This CCC service is requested for the following timeframes: day-ahead, intraday capacity and long-term (yearly and monthly). In 2020, Coreso performed Capacity Calculations day-ahead and intraday for both the north Italian border (Central Southern Europe zone) and for the Central-Western Europe zones. Additionally, Coreso carried out the capacity calculation day-ahead for South-Western Europe. Moreover, Coreso with TSCNET executed parallel computations every day for the Core CCR, covering the day-ahead timeframe, where the CCC service is currently in development.

3.2.4. Short Term Adequacy

In 2020, the launch of the Pan-European STA process was achieved, a process that involves all TSO and all RSC on Pan-European level.

European countries are currently and increasingly facing the challenge of responding to load – i.e. demand – with sufficient electricity generation. The underlying reasons for this are the strong and intermittent presence (or absence) of renewable energy and the increasingly uncertain profitability of conventional generating facilities.

If energy is not present – at any given time – in a country, potential help from other countries depends on the overall availability of electrical energy and the grid capacity to transmit it to the country in need of energy.

Coreso has a leading role in the development of the service on a Pan-European level involving the five European Regional Security Coordinators (RSCs).

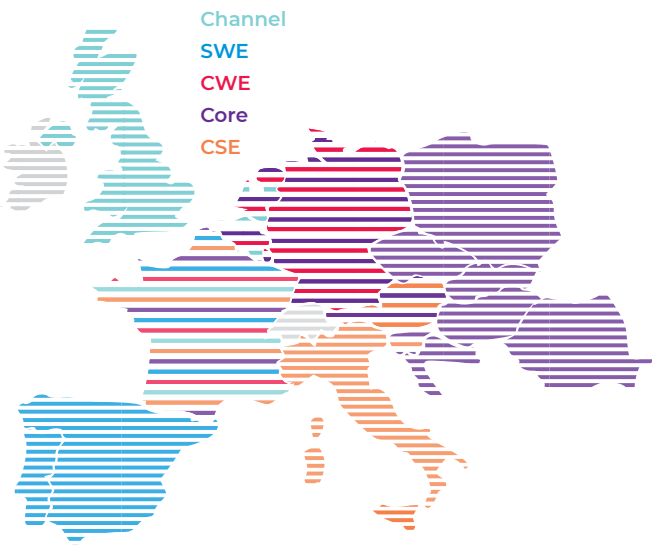
3.2.5. Outage Planning Coordination

In 2020, the launch of the Pan-European OPC process was achieved, a process that involves all Transmission System Operators and all Regional Security Coordinators on a Pan-European level. The regional process was also implemented and went live.

This service aims to:

- Identify outage incompatibilities between relevant assets (grid elements, generators, loads) whose availability status has cross-border impact and limiting the potential repercussions on the European grid and production by relevant coordination of planned outages timing.
- Propose solutions to relieve these incompatibilities: at least non-costly remedial actions, adaptations of availability and outages' planning (firstly on grid elements, secondly on other elements if no solution is available).
- Coordinate findings and Remedial Actions proposals with other adjacent RSCs.

This service is requested for the year-ahead and week-ahead timeframe. Updates are done up to week-ahead based on TSOs request for planning modification or significant changes to the expected operational conditions.



3.3. Company Transformation Process

This year, Coreso implemented the Project Management Office in order to have a more standardised approach to projects within the organisation. On the HR side, competency management has been formalised with function descriptions linked to a competency matrix. A process of compliance checks on running services was also implemented in 2020.

Further work is foreseen in the domain of project management, resource management and structuring the company in line with the value chain of Coreso.

3.4. COVID Adaptation

Coreso quickly adapted to the COVID situation. Half of the control room process has been organised to function in remote work and the remaining physically present operators were spread over multiple offices.

Activities not linked to control room operations have been switched towards maximum telework and strict rules have been implemented in office spaces to ensure appropriate distancing and cleaning. Individual screens have been provided to all staff to ensure proper working conditions at home.

COVID had a major impact on work organisation, yet a minor impact on Coreso activities and delivery.

4. OUTLOOK

4.1. Provision of the Five Services

CORES0 is currently in the final phase - estimated to last another year - of implementing the 'five services' defined by the European TSOs to be performed by RSCs. EU legislation has reinforced the role of RSC and described roles and responsibilities of RSCs through Network Codes: System Operation Guideline¹, guideline on Capacity Allocation & Congestion Management², forward capacity allocation³ and Emergency and Restoration⁴. In addition, Coreso has implemented further services in the framework of the Clean Energy Package⁵.

It must be pointed out that Coreso fulfils its role in preparing full implementation of the five mandatory services but also acts as a developer of criteria and procedures for ENTSO-E (hence for all associated TSOs).

4.2. Clean Energy Package

As of 1 January 2020, a new Regulation of the European Parliament and of the Council on the internal market for electricity is applicable. This regulation is part of the legislative package on which the European institutions have been working on for the last years, better known as the 'Clean Energy for all Europeans Package (CEP). The Clean Energy Package foresees further services to be performed by RSCs/RCCs.

This year, Coreso contributed with the European TSOs in redacting the explanatory notes describing practical aspects for the implementation of the Regional Coordination Centres (governance, financing, internal rules...). These notes were presented to the National Regulatory Authorities. The final approval is expected in 2021.

5. SUBSIDIARIES

The company has no subsidiaries.

6. EVENTS AFTER THE END OF THE YEAR

Coreso does not anticipate any event that could affect the financial performance of the company in the short term.

7. NOTES TO THE ANNUAL ACCOUNTS

7.1. Introduction

7.1.1. Key figures

| IN THOUSAND € | 2019 | 2018 |
|-------------------------|---------|---------|
| EBITDA* | 4 272.9 | 3 087.3 |
| EBIT* | 924.9 | 824.4 |
| Net result (before tax) | 887.6 | 792.3 |
| Net result (after tax) | 546.0 | 430.4 |
| Solvency ratio | 27.83% | 27.58% |
| Liquidity ratio | 45.54% | 43.52% |

Solvency = equity/total assets
Liquidity = current assets/short-term liabilities

*EBIT = earnings before interest and taxes
*EBITDA = EBIT + amounts written off/depreciation

¹ Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation.
² Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management.
³ Commission Regulation (EU) 2016/1719 of 26 September 2016 establishing a guideline on forward capacity allocation.
⁴ Commission Regulation (EU) 2017/2196 of 24 November 2017 establishing a network code on electricity emergency and restoration.
⁵ Commission Regulations (EU) 2019/941-944 of 5 June 2019.

7.2. Balance Sheet

7.2.1. Assets

| IN THOUSAND € | 2020 | 2019 |
|-------------------------------|-----------------|-----------------|
| Intangible fixed assets | 6 427.9 | 5 412.1 |
| Property, plant and equipment | 2 592.7 | 2 515.4 |
| Non-current assets | 9 020.6 | 7 927.5 |
| Trade & receivables | 3 037.0 | 3 124.1 |
| Cash & cash equivalents | 1 167.0 | 328.1 |
| Deferred charges | 213.0 | 195.8 |
| Current assets | 4 417.0 | 3 647.9 |
| Total assets | 13 437.6 | 11 575.4 |

7.2.2. Equity and Liabilities

| IN THOUSAND € | 2020 | 2019 |
|----------------------------------|-----------------|-----------------|
| Capital | 1 000.0 | 1 000.0 |
| Reserves | 100.0 | 100.0 |
| Retained earnings | 2 639.0 | 2 092.9 |
| Equity | 3 739.0 | 3 192.9 |
| Current liabilities | 9 426.6 | 8 110.0 |
| Accrued charges/ deferred income | 272.0 | 272.5 |
| Liabilities | 9 698.6 | 8 382.5 |
| Equity & liabilities | 13 437.6 | 11 575.4 |

7.2.3. Notes

7.2.3.1. Non-current Assets

| IN THOUSAND € | 2020 | 2019 |
|---------------------------------|----------------|----------------|
| Intangible assets | 11 812.2 | 8 166.8 |
| Depreciation intangible assets | (5 384.3) | 2 754.7 |
| Tangible assets | 8 879.3 | 8 083.6 |
| Depreciation tangible assets | (6 286.6) | 5 568.2 |
| TOTAL NON-CURRENT ASSETS | 9 020.6 | 7 927.5 |

An amount of 4 441.0k € was invested in 2020, of which 3 645.4k € in software and 795.6k € in hardware and other tangible assets.

The net book value of fixed assets was 9 020.6k € and includes cumulative depreciations at year-end 2020 totalling 11 670.9k €.

7.2.3.2. Current Assets

Trade and other receivables totalled 3 037k € compared to 3 124k € end of 2019.

'Other amounts receivable' consists mainly of recoverable taxes and VAT and reimbursable social security contributions.

At year-end the cash and cash equivalents amount to 1 167k € compared to 328k € end of 2019.

7.2.3.3. Deferred Charges and Accrued Income

This item comprises operating expenses to be deferred to accounting year 2021 (213k €).

7.2.3.4. Equity

As of 31 December 2020, share capital totalled 1 000k €, represented by 15,210 shares and was fully paid at the time Coreso was established.

The legal reserve (100k €) amounts to 10% of subscribed capital and is fully constituted.

The profit of the year has been carried forward bringing the total reported result to 2 639k €.

Equity amounted to 3 739k € after appropriation of the 2020 result.

7.2.3.5. Current Liabilities

At the end of 2020, financial short-term liabilities amounted to 3 200k €. Coreso utilises a 3 600k € mixed credit facility agreement consisting in short-term advances (between 90 and 365 days) and overdraft facilities. This agreement is not limited in time and the interest rate is 0.75% per year for the short-term advances and 1% for the overdraft facility.

'Trade debts' at year-end 2020 totalled 4 651k €. They relate to invoices not yet due totalling 340k € and invoices to be received totalling 4 299k €.

Social security liabilities cover many provisions such as holiday allowances, bonuses and personnel insurance. The total amount for this item is 1 508k €.

An amount of 67k € is recorded under 'Tax debts' and relates to corporate income tax payable on the results of accounting years 2019 and 2020.

7.2.3.6. Accrued Charges and Deferred Income

This item mainly comprises accrued charges totalling 272k €.

7.3. Income Statement

| IN THOUSAND € | 2020 | 2019 |
|-------------------------------|-------------------|-------------------|
| Service fees | 19 423.7 | 17 313.3 |
| Other operating income | 665.9 | 346.6 |
| Operating Income | 20 089.6 | 17 659.9 |
| Services and other goods | (7 448.6) | (6 778.2) |
| Remuneration, social security | (8 368.2) | (7 794.4) |
| Amortisation | (3 347.9) | (2 262.9) |
| Other charges | 0.0 | 0.0 |
| Operating Charges | (19 164.7) | (16 835.4) |
| Operating result | 924.9 | 824.4 |
| Financial result | 0.1 | 0.0 |
| Financial charges | (37.4) | (32.1) |
| Taxes | (341.6) | (361.9) |
| Net Result | 546.0 | 430.4 |

7.3.1. Operating Income

Operating income can be subdivided as follows:

| IN THOUSAND € | 2020 | 2019 |
|------------------------|-----------------|-----------------|
| Service fees | 19 423.7 | 17 313.3 |
| Other operating income | 665.9 | 346.6 |
| Total | 20 089.6 | 17 659.9 |

The service fees relate to a number of analysis services for the grid, as described in chapters 3.2 until 3.7 of this annual report and are based on the 'cost-plus' mechanism (operational service fees).

'Other operating income' encompasses mainly recovery of withholding tax.

7.3.2. Services and Other Goods

Services and other goods totalled 7 449k € in 2020 (6 778k € in 2019) and relate mainly to the costs of IT maintenance and consultants and rents. The increase is due to the increased activities of Coreso.

7.3.3. Personnel Expenses

Remuneration and social security costs are broken down as follows:

| IN THOUSAND € | 2020 | 2019 |
|---------------------------------------|----------------|----------------|
| Remuneration | 6 317.6 | 5 921.5 |
| Social security & pension funds costs | 1,958.8 | 1 799.5 |
| Other expenses | 91.8 | 73.4 |
| Total | 8 368.2 | 7 794.4 |

The increase is mainly due to the increase in full-time equivalents.

7.3.4. Depreciation

Depreciation of property, plant and equipment totalled 3 347.9k€ and is calculated according to the valuation rules approved by the Board of Directors, as indicated in the annual accounts.

7.3.5. Financial Result

A net financial charge of 37k € is recorded in 2020, mainly due to interests related to the financial liabilities.

7.3.6. Taxes

Profit before tax amounts to 888k €. After considering disallowed costs, Coreso's corporate income tax amount for 2020 is 342k €.

7.3.7. Net profit

In 2020, Coreso reached a net profit after tax of 546k €.

| IN THOUSAND € | 2020 | 2019 |
|---|---------|---------|
| Profit of the accounting year | 546.0 | 430.4 |
| Profit carried forward from the previous year | 2 092.9 | 1 674.4 |
| Appropriation to the legal reserve | 0.0 | 11.9 |
| Distribution of the dividend | 0.0 | 0.0 |
| Result to be carried forward | 2 638.9 | 2 092.9 |

7.4. Appropriation Account

At the Ordinary General meeting to be held on April 2021, the Board of Directors will propose the following appropriation:

8.4. Data Security

Coreso collects and stores sensitive data, its own business data and that of their business partners. Coreso is subject to several privacy and data protection rules and regulations, including, as of May 25, 2019, the General Data Protection Regulation (EU Regulation 2016/679 of April 27, 2016). Besides this, we tend to be compliant towards ISO27001 regulations. Despite all precautions taken, important system hardware and software failures, failure of compliance processes, computer viruses, malware, cyber-attacks, accidents or security breaches could still occur.

Any such events could impair the ability of Coreso to provide all or part of its services and generally may result in a breach of its legal and/or contractual obligations. This could, in turn, result in legal claims or proceedings, contractual liability, liability under any other data protection laws, criminal, civil and/or administrative sanctions, a disruption of the operations of Coreso, or damage to the reputation of Coreso, and in general could adversely affect the business of Coreso.

Coreso continuously adapts its processes and is putting in place new processes to ensure compliance.

8.5. HR Risks

Coreso's strength lies in the quality of its staff, exposing the company to various risks, i.e., inadequate skill sets, the strain of work shifts inherent to Coreso's monitoring activities and employee turnover.

Coreso relies on the pool of experts provided by its shareholders to fill any sudden gaps in human resources and has drawn up plans for joint training with the engineers employed by its TSOs. In addition, Coreso started a competence exercise to determine which skills are missing at Coreso enabling us to prioritise future recruitments. Required skills evolved from pure operational and expertise to general project-management profiles with financial acumen. To cope with future challenges, Coreso will maintain the quality of its staff with the engagement of new personnel keeping a good balance between direct recruitment and recruitment via shareholders in order to preserve stability and shareholders expertise.

8.6. Pandemic Risk (COVID type)

Coreso has been affected by the COVID pandemic. This has had an impact on its ability to carry out its activities. However, Coreso manages to minimise the impact of this crisis.

Business continuity plans are up to date. These include a resilience planning for critical functions. For its activities, Coreso encourages the use of teleworking for the administrative functions. Coreso has also integrated health-related actions for its personal whose presence is required in the office to assure its mission.

8.7. Regulatory Risks

The consolidation of international power exchanges following the liberalisation of the European electricity market, combined with the need to ensure overall security of supply in Europe, led to a need for increased cooperation and coordination among European TSOs and the creation of the RSCs.

The need for greater coordination is now widely acknowledged and the coordination between TSOs is formalised in EU legislation (Network Codes and Clean Energy Package adopted in 2020). The roles and responsibilities of TSOs and RSCs are defined in those EU legislations.

In 2020, Coreso and other RSCs proactively collaborated with TSOs to build appropriate solutions to propose the operating details and methodologies of RSCs activities. TSOs were due to propose these operating details and methodologies of the RSCs activities to the regulators. These definitions, as well as the uncertainty around the approval timeline, may significantly impact Coreso's roadmap and implementation planning.

Unplanned and/or inconvenient changes or misinterpretations in regulatory or policy mechanisms could conflict with Coreso's existing and envisioned strategy causing financial and organisational impacts.

8.8. Other Risks

Coreso realises that there may be other risks of which the company is unaware, or that risks currently deemed negligible may become more significant in the future.

8. DESCRIPTION OF THE RISKS AND UNCERTAINTIES FACING THE COMPANY

8.1. Financial Risks

Coreso's funding needs are met by the contributions of its shareholders. To meet its needs, Coreso draws up a budget and a business plan and reviews it in an appropriate time with its shareholders, which are also its main customers. In the event of unforeseen funding needs, Coreso can appeal to its shareholders for the release of extra cash at very short notice.

Since its shareholders are also exposed to inherent financial risks, there is a residual financial risk for Coreso if any of its shareholders' default. However, Coreso's residual risk remains very low where its shareholders are considered.

8.2. Data Quality Risks

In its role as a coordinator of Transmission System Operators (TSOs), Coreso performs analyses of cross-border electricity flows, advises TSOs on congestion management, and contributes to Security of Supply (SoS) operations. To perform these tasks as effectively as possible, Coreso relies heavily on data from all the TSOs concerned and on this data being complete, validated according to the agreed acceptance criteria, consistent, accurate and delivered on time. Initiatives are underway within ENTSO-E to put in place a structural framework for the provision of harmonised qualitative data by TSOs. Coreso is actively involved in this.

8.3. ICT⁶ Risks

Coreso is also highly dependent on the continuity of its ICT infrastructure to deliver its services in an appropriate time.

The management of the ICT infrastructure, including software applications and their hosting and data storage, are being outsourced to external suppliers and service providers. A single supplier acts as the first line of support for troubleshooting any ICT issues. All contracts with ICT providers include guarantees on long-term support and maintenance services for all critical ICT components.

The power supply of ICT infrastructure is also backed up by uninterruptible power supply systems in Brussels and Lomme (France).

Coreso takes appropriate measures to revise, update and back up its ICT processes and hardware, software and network protection (for example, failover mechanisms) on an ongoing basis to the maximum extent permitted by technical and financial considerations.

In the continuous improvement effort pursued by Coreso, the implementation of an Information Security Management System (ISMS) has been initiated to manage the information security aspects of the IT operations.

9. RESEARCH AND DEVELOPMENT

To define calculation methodologies, develop tools and implement new services, Coreso has its own "Development Unit" and collaborates, among other partners, with RTE Research and Development Department. Coreso constantly develops its activities by designing new coordination processes that require innovation in terms of both methods and tools.

⁶Information and Communication Technologies.

GLOSSARY

50Hertz: One of the German TSOs.
Visit the website at www.50hertz.com/en

AC / DC: Alternating Current / Direct Current.

ACER: Agency for Cooperation of Energy Regulators.

Baltic RSC: The RSC of the Baltic region.
Visit the website at www.baltic-rsc.eu

CACM: Capacity Allocation and Congestion Management.

CC: Capacity Calculation.

CCC: Coordinated Capacity Calculation.

CCM: Capacity Calculation Methodology.

CCR: Capacity Calculation Region.

CEP: Clean Energy Package.
Visit the website at www.entsoe.eu/cep/

CGM: Common Grid Model.

CGMES: Common Grid Model Exchange Standard.

CGS: Critical Grid Situation.

CSA: Coordinated Security Analysis.

CWE: Central Western Europe.

DA: Day-ahead - term used for Capacity Calculation.

EirGrid: The Irish TSO.
Visit the website at www.eirgridgroup.com

Elia: The Belgian TSO.
Visit the website at www.elia.be/en

ENTSO-E: European Network of Transmission System Operators for Electricity.
Visit the website at www.entsoe.eu

EU: European Union.

FB: Flow-Based.

HVDC: High-Voltage Direct Current.

ID: Intraday.

IGM: Individual Grid Model.

IN: Italy North.

IT: Information Technology.

IU: Ireland - United Kingdom.

KPI: Key Performance Indicator.

LT: Long-term.

NGESO: National Grid Electricity System Operator.
The United Kingdom TSO.
Visit the website at www.nationalgrideso.com

NRA: National Regulatory Authority.

Nordic RSC: The Nordic region RSC.
Visit the website at www.nordic-rsc.net

OPC: Outage Planning Coordination.

OPDE: Operational Planning Data Environment.

OPI: Outage Planning Incompatibilities.

Pan-EU: Pan-European.

PEA: Post Event Analysis.

PID: Project Initiation Detail.

RA: Remedial Action.

RCC: Regional Coordination Centre.

REE: Red Eléctrica de España.
The Spanish TSO.
Visit the website at www.ree.es/en

REN: Redes Energéticas Nacionais.
The Portuguese TSO.
Visit the website at www.ren.pt/en-GB

ROSC: Regional Operational Security Coordination.

RSC: Regional Security Coordinator.

RTE: Réseau de Transport d'Électricité.
The French TSO.
Visit the website at www.rte-france.com

SA: Security Analysis.

SEleNe CC: The Southeast Electricity Network Coordination Center RSC based in Thessaloniki.

SCC: Security Coordination Center.
The South Eastern European region RSC.
Visit the website at www.scc-rsci.com

SOC: System Operation Committee.

SOGL: System Operation Guidelines.

SONI: System Operator of Northern Ireland.
The Northern Ireland TSO.
Visit the website at www.soni.ltd.uk

SOR: System Operation Regions.

STA: Short Term Adequacy.

SWE: South Western Europe.

Terna: The Italian TSO.
Visit the website at www.terna.it

TSCNET Services: The Munich-based Regional Security Coordinator.
Visit the website at www.tscnet.eu

TSO: Transmission System Operator.

YA: Year-ahead.



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